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March 28, 1949

MAR 28 1949

STEEL

The Magazine of Metalworking and Metalproducing

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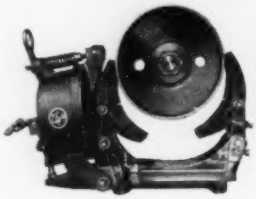

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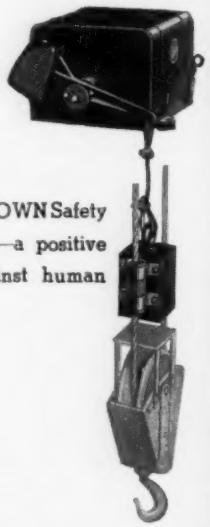

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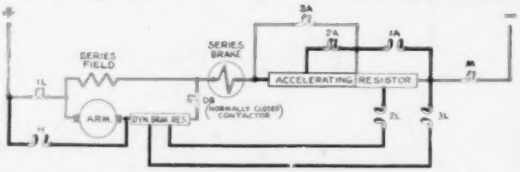

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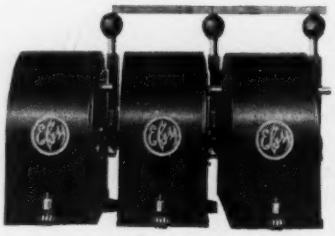

Narrow Width permits close grouping. Shown at the left are three masters with handles on 9-inch centers. Several of these switches can be reached from one operating point.

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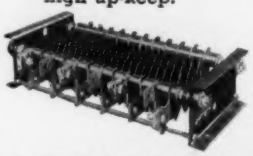

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Behind the Scenes...

Corporate Impunity

Webster's dictionary is usually the source of good & correct information. However, sometimes you locate things in there which are surprising, to say the least. For example, that extensive tome contains among other things a definition of Crucible Steel. We know that's the name of a large company whose main office is in New York, and whose product is well known to users of alloy steels. Webster, however, says that it's just another name for Superior Steel, which is another good producer of steel products whose main office is in Pittsburgh. Until Webster told us, we'd have sworn there wasn't any connection!

Impronounceable

In order to fill this column with more than the usual amount of nonsense, we have done some cribbing. According to Webster, that means a small theft, so we have done some small thievery from the *Postage Stamp,* which in turn cribbed from *Everybody's Digest* which cribbed from *Time* the fact that *Time* had cribbed from the *London Times* the fact that its New Zealand correspondent says there is a town down in his country with the improbable name of Taumatawhakatangihangakoauauotamateapokaiwhenuakitanatahu. It's awful, the things you find in print sometimes!

Five Decades Back

Our issue of March 30, 1899, reports that the Engineers Society of Western Pennsylvania is working on a plan of smoke abatement for the City of Pittsburgh. One of the country's largest steel plants reports it now has nearly 8000 horsepower of electric motors in operation, and lifting magnets are finding some use in handling steel plate by crane. A large fire in Cleveland destroyed the plants of the Dangler Stove Co., and the Cleveland Machine Screw Co. Orders are reported from Russia on all kinds of improved machinery, and in Pittsburgh an important coal man is considering the possibility of building a steel barge for river coal handling.

Thanks to the Govt.

We have become more or less accustomed to thanking people in this space for nice things they do for us or say about us. Since this is being written during income tax week, it doesn't seem right to be thanking the government for anything, but we are going to do so anyhow. It seems that people have been asking Washington for information on primary sources of steel prices, and the government has been referring those people to us, particularly in re: our special material on the steel industry's new pricing system (f.o.b. mill to you). Here in our little cubbyhole under the steam pipes we've long considered our editors the acme of information on steel prices, and we're happy to note that the Yewnited States Government (pronounced guvmnt in Washington) is now backing up our judgment. We still have a few copies of that special job of last September kicking around; if the new buyers' market in steel means you're looking around for a new source of supply on bars, plates, or any other steel product, we'd be glad to send out a copy to you.

Ask Us, We'll Give

Yes, in answer to requests for information, we *do* have copies of that article of last week on the steel industry's future expansion. Drop us a line if you'd like to have us ship you one.

Puzzle Corner

The farmer of our Mar. 14 issue had 31 chickens and 4 cows. Unless, according to J. J. Reich of Huntington, W. Va., two of the cows had 5 legs, in which case 32 chickens and three cows would round out the farmer's stock. Nearly everyone has sent in the right answer to the train problem, answer given last week, and since many of you were undoubtedly sharpened up by figuring your income tax problems, here's a simple one for relaxation. Par for the course is 4 minutes. Has to do with one of the office boys in a steel drum plant, who asked the company accountant to help him with his income tax. According to our hero, his only deduction was $3 to the Community Fund, with his personal exemption of $600. The accountant said, "Well, your tax rate is 19%—so here's the amount of your tax." When he looked at the figure, the office boy noted that it was exactly 10% of what he had been paid. How much was his tax?

Shrdlu

(Editorial Index—page 29)

STEEL

Vol. 124—No. 13 March 28, 1949

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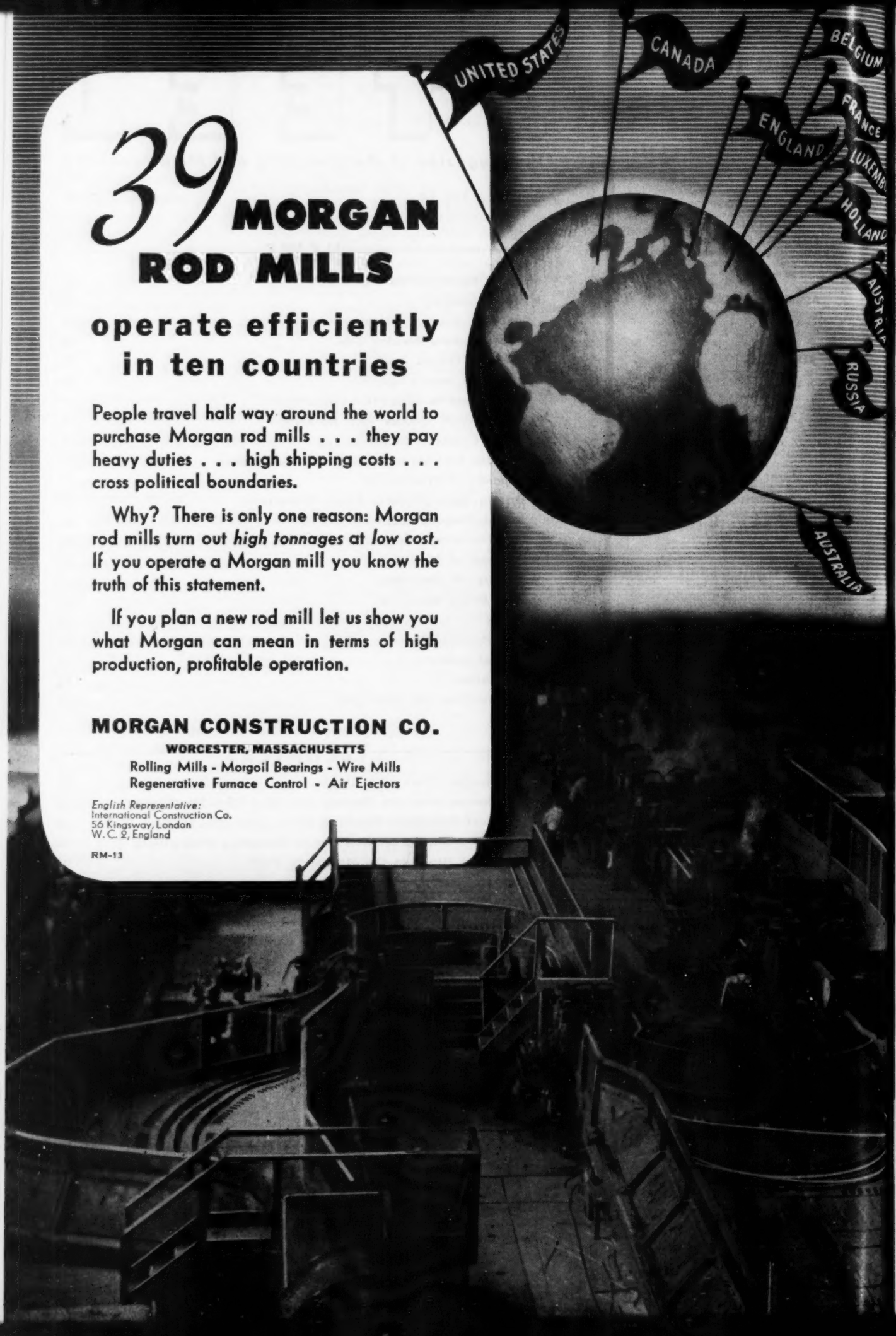

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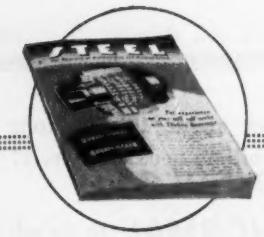

March 28, 1949

Atlantic Pact

Newest of the important problems confronting Americans in the rapidly changing panorama of world affairs is the North Atlantic pact. In essence it is an agreement, which if adopted, would serve notice that the United States, Canada, Great Britain and the principal countries of western Europe will stand together in case of armed attack by an aggressor.

The Senate probably will confirm the treaty on the grounds that it is a necessary step to take in view of this nation's present position. As Senator Vandenberg has pointed out, World Wars I and II were started because the Kaiser and Hitler believed the United States would refuse to be involved in a European war. The pending security pact would provide advance notice of the determination of the United States to intervene in any development which seemed to threaten a third world war. If the senator from Michigan is correct in his appraisal that the Atlantic pact is the "greatest war deterrent ever devised," then it will be cheap at whatever it may cost.

However, its cost will have an important bearing upon national policy in the United States during the next decade. While the Monroe Doctrine, which really was a security pact, worked well without appreciable cost to the United States, we dare not hope that the North Atlantic pact can be effective unless we are prepared to extend some financial assistance to other signing countries.

At the present time nobody can predict what this cost will be. However, we should realize that there is a limit to the amount of money the nation can raise annually. If the cost of the new security pact is going to increase the national budget substantially, then the government must cut expenses of other operations accordingly.

The possibility that the Atlantic pact will require several billion dollars soon should cause President Truman to scale down his demands for extravagant expenditures at home. Success of the security pact, of the European Recovery Program and of every other activity supported by our nation rests solely upon our ability to maintain a sound financial position. We must trim to a balanced budget which requires no more than 25 per cent of the national income for taxes.

* * *

SOONER THAN EXPECTED: Current developments in the finished steel market illustrate how rapidly a tight situation as to supply can disappear.

At the turn of the year, many steel men felt that in spite of the signs of easier demand which were then discernible the backlogs of orders on mill books would support capacity operations throughout the first half of the year and into the third or possibly fourth quarter. Today it is apparent that these forecasts were optimistic. Supply has overtaken demand in many products and in the case of the few items in which demand still exceeds supply, a balance will be achieved much sooner than had been anticipated.

The result of this earlier than expected return to a buyers' market in some steel products is manifest in prices and to a lesser extent in operations. The so-called gray market has evaporated and most of the premium prices which prevailed for many months have been reduced to conform more closely with standard prices. While the steel ingot operations of the entire industry continue at around or above theoretical capacity, a number of open hearth and electric

(OVER)

furnaces—producing alloy and specialty steels—have been taken out of production.

Developments in April may afford a clue as to how far the present adjustment may be expected to go. Somewhere along the line in the near future, one should be able to gage the level of demand for current needs—now that the job of catching up on accumulated demand has been virtually completed. —pp. 39, 129

* * *

VISITORS FROM ABROAD: Visiting in the United States at the present time are a group of Danish technicians, who are inspecting shipbuilding operations, and a party of British foundrymen, who are viewing operations in castings plants. These are the first of several dozen groups which will come here from Europe under Marshall Plan sponsorship to study production methods.

Undoubtedly these visitors will find some practices and methods in plants here which can be adapted to advantage in their plants at home. However, there may be an important by-product of their visit in the impressions they acquire of the manner in which the average family lives in the United States. It will be interesting to know to what extent, if any, visitors from countries where extensive government regulations are in force notice the comparative freedom of action which is accorded citizens under our form of government. —pp. 37, 48

* * *

EIGHT BILLION NEEDLES: A report from England dealing with present efforts to apply mass production techniques to traditional craft industries in order to improve their economic status sheds light on the obscure but important business of manufacturing needles.

According to this report, world consumption of needles is about 8 billion annually. Included are not only the familiar sewing needles, but also knitting pins, crochet hooks, surgeons' needles and phonograph needles. Whereas Great Britain, with an output of 750 million annually, trailed Germany and Japan in the prewar period, today she is the world's leading manufacturer of needles, with an annual output of 1,250 million, 80 per cent of which is exported. The British needle industry, comprising 12 firms clustered about Redditch in Worcester, employs 2000 workers and uses about 30,000 tons of steel a year.

At the British ratio of steel consumption to output, the world requires about 177,750 tons of steel annually for its 8 billion needles. —p. 47

* * *

SCRAP STILL ABNORMAL: In an address at Cleveland last week, E. C. Barringer, executive vice president of the Institute of Scrap Iron & Steel Inc., made a remark which illustrates how far the domestic scrap situation has departed from prewar normal.

He observed that "prior to World War II scrap dealers sometimes had as much as 2 million gross tons of scrap in their yards. Currently, according to the U. S. Bureau of Mines, dealers' stocks are less than 200,000 tons." The truth is that almost everybody interested in scrap has become so accustomed to witnessing a hand-to-mouth movement of the material that we have forgotten that under normal conditions scrap dealers perform the important function of carrying sizable inventories, from which consumers—particularly foundries—can draw upon as needed.

Restoring the traditional scrap cycle will not be easy, but the sooner this task is completed, the better it will be for everybody concerned.

—p. 49

* * *

ROUTING PLANT TRUCKS: Any observant rider in a taxicab knows that the better the communication between dispatchers and cab drivers—either through phones at stationary call boxes or by radio-phone in the cab—the better the cab fleet is able to serve its customers.

Pratt & Whitney Aircraft has adapted this idea in dispatching industrial trucks in the 50-acre production area of its Hartford, Conn., plant. Telephones installed at strategic points throughout the plant are connected with the dispatcher's office. When any one of the 132 roving truckers discharges his load at its destination, he calls the dispatcher from the nearest phone, instead of returning with his truck to a central station. Usually the dispatcher is able to assign him another load at a nearby point.

While this system has increased telephone traffic considerably, it has eliminated a great deal of backtracking, reduced empty truck mileage and generally equalized work distribution.

—p. 65

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

BUSINESS WEATHER— Declining demand for conversion, alloy and some silicon steels has caused a number of steelmaking furnaces to be taken out of production (p. 39) . . . Unemployment continues to increase, now stands at 5.6 per cent of the labor force. This is the highest since early in the war but is well below the prewar average (p. 38). . . Small jobbing foundries continue to find business slack, although the larger captive shops are busy (p. 39) . . . As private business eases, public works are becoming more dominant (p. 42), may be used by the government to bolster sagging employment.

ARMS FOR EUROPE— Will the North Atlantic Security Treaty bring new demands for armament and munitions manufacture to the metalworking industry, to offset current disinflation and possibly bring a return of material shortages? This is one of the questions being pondered by industrial executives (p. 37) as they await the spelling out of requirements under the pact.

ALLOCATIONS CUT— Voluntary allocations of steel for favored programs have been cut 24 per cent, or 95,500 tons monthly (p. 37). June allocations, including the new programs, will be only 442,802 tons, compared with 594,231 tons in February. Should steel supplies continue to ease, the program may become meaningless later this year.

STEEL DISTRIBUTION— The automotive industry maintained its position as the leading consumer of steel products by using more than 10 million tons, or 15.4 per cent of total finished steel shipped in 1948 (p. 40). In second place was the construction industry, followed by containers and rail transportation. Total shipments last year were 66,140,456 tons, compared with 63,057,150 tons in 1947.

SHIPPING SEASON OPENS— At lower lake ports, huge ore freighters last week began to move up the lakes for the first trip of what may be a record peacetime ore carrying season (p. 39). Shippers hope to exceed last year's movement of 83 million tons. A mild winter has alleviated ice conditions which often delay the start of navigation on the lakes.

STEEL EXPORTS— Quotas for overseas steel shipments soon may be liberalized, but controls over exports are likely to be retained for a long time to come. This is the word from government officials in charge of regulating foreign trade (p. 41), who say controls are necessary for security reasons. However, they are becomingly increasingly concerned over competition of foreign producers and the decline in sales to Latin America.

EUROPE— Great Britain is applying mass production techniques to traditional craft industries (p. 47) to raise output for export. These techniques have enabled Britain to become the world's leading producer of such items as sewing needles, with an annual output of 1350 million, 80 per cent of which are exported. Lacemaking machinery also is being built on assembly line methods and provides another export item.

HERE AND THERE IN INDUSTRY— Decision on the complaint of Chrysler and independent automakers against what they contend are discriminatory freight rates is awaited from the Interstate Commerce Commission (p. 51) . . . Machine tool orders (p. 43) declined in February . . . Government appropriations for construction in 1949 totals $2.4 billion (p. 44) . . . National Steel Corp. spent $27 million on additions last year, started 1949 with a $40 million expansion program (p. 54) . . As result of recurrent coal mine strikes, the Atomic Energy Commission is detouring around use of this fuel, plans consumption of 60 million cu ft of natural gas daily (p. 44) . . . Return of scrap stockpiling by dealers is predicted by spokesmen for the scrap industry (p. 49).

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STEEL
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Industry Ponders Atlantic Pact

Implications of proposed security treaty to nation's economy remain to be determined. Extent of European rearmament and effect on raw material supplies unknown

WILL the North Atlantic Security Treaty, with its implications of rearming Europe through American productive and financial assistance, lead to military demands on the nation's economy that will result in another period of severe material shortages?

That was only one of a number of questions turning over in industrialists' minds last week as they sought to appraise the outlook in light of the new international situation seen emerging as result of the treaty.

As of today no one knows with any certainty just what industry can expect over coming months in the way of armament demands. Current indications are nothing in the way of armament for Europe is in the immediate offing, however. Informed Washington circles reveal not even a tentative rearmament assistance program for Europe has been set up. Further, there is no hint as to the type of strategic defense that will be evolved for western Europe except, in a general way, chief initial reliance will be on aerial protection plus submarine defense of our shores, inland installations and shipping.

Warning System — This strategy will receive notable acceleration through enactment of the bill now waiting the President's signature to establish a land-based air warning system to protect North America. This program will call for heavy tonnages of light metals depending on the size of the Air Force procurement plans. In this connection the House last week voted for an increase in the Air Force from the present 59 groups to 70 groups.

While this program will not cause any immediate great increase in steel demand, this prospect may be suddenly changed as a result of studies now under way by the agencies most concerned. Both the State Department and the National Military Establishment are now mapping out a long-range North Atlantic defense program. Present indications, however, are this will not reach active stage immediately due to the necessity of making basic strategic decisions.

Inquiries on Capitol Hill reveal that the whole subject of materials supply in relation to present and possible future needs will be opened up by the Maybank subcommittee of the Senate Banking & Currency Committee this week when it starts hearings on the administration's bill to authorize economic controls.

Consider Controls — A committee spokesman told STEEL that while there is much opposition to authorizing controls on a purely domestic basis in view of the rapidity with which disinflation has gained in recent weeks, there is a widespread feeling that the President should be given economic control authority on a national security basis.

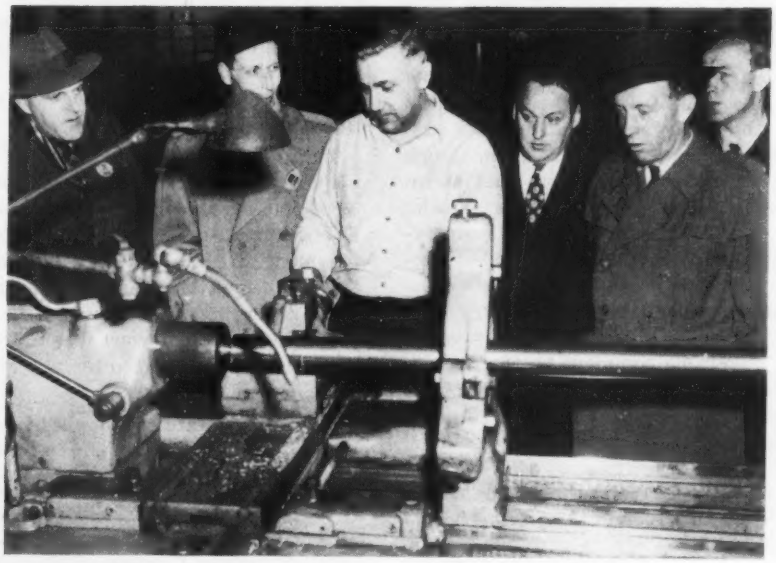
The Senate subcommittee will endeavor to ascertain what the long-range security program, including the North Atlantic pact, will mean in terms of materials and whether the situation warrants giving the President standby rationing, price and wage controls. It also will go into that provision of the bill which would give the President power to construct new steel and other capacity, either directly by the government or by contract with industry.

See Balance Soon—Extent of recent disinflation as seen by government economists is indicated by sharp revisions in their estimates of supply-demand relationships. Among government economists who follow the steel situation, the expectation is that production will equal demand in second half although they think such products as line pipe, small galvanized pipe, galvanized sheets, wide heavy plates and special types of silicon sheets may continue hard to get in the last half of the year.

Allocations Cut 24 Per Cent

OVERALL cut of approximately 95,500 tons monthly, or 24 per cent, in voluntary steel allocations will be effected in June, the Office of Industry Cooperation, Department of Commerce announced last week.

This cut takes into consideration



DANES SEEK KNOW-HOW: Part of a group of Danish technicians brought to the United States under the Marshall Plan to study modern shipbuilding techniques are inspecting lathe operations in the machine shop of Dravo Corp.'s shipyard, Pittsburgh. Pictured, left to right, are: James C. Meem, project manager of Economic Co-operation Administration; Jens Rahbek Rorth, assistant manager, Odense Steel Shipyards, Odense, Denmark; Francis M. Fuhry, Dravo machinist; Leonard Thornberg, president of a shipbuilders' union local; Peter Aage Andersen, plater at Odense shipyard; and Axel J. D. Pedersen, welder at Odense shipyard

the new voluntary programs which have been approved since February. Programs in effect during the latter month will undergo a cut of 150,629 tons or 27 per cent.

As a result of the reductions, forecast in STEEL (Mar. 21, p.61 and Mar. 14, p.57), overall tonnage on allocation in June will total 442,802 tons monthly. This compares with 594,231 tons in February.

The following is a comparative breakdown of individual program allotments:

Industry	Tons April	Tons May	Tons June
Anthracite mining	3,130	3,130	2,000
Armed Forces	102,505	102,505	64,371
Atomic energy	16,414	16,414	10,340
Barges	25,000	25,000	11,202
NACA	1,926	1,926	614
Freight cars	249,682	238,823	174,953
Ore cars	2,192	2,192	2,192
Merchant vessels	15,414	15,414	11,729
Mining machinery	31,785	31,785	31,785
Oak Ridge pipeline	4,750	4,750	4,750
Steel houses	.....	.....	.....
Oil field equipment	18,530	18,530	16,530
Tankers	40,380	40,380	31,551
Warm air heating	26,400	26,400	26,400
Totals	538,108	527,249	386,417
NEW PROGRAMS			
Baseboard radiation	950	950	950
ECA	33,357*	33,319	33,394
Grain bins	8,400	8,400	8,400
Reclamation work	12,470*	11,315	13,641
Grand total	547,458	581,233	442,802

* February tonnage.

Steel Record Outstanding

ONLY the steel and automotive industries still were operating in a sellers' market as the nation's economic position slipped downward from the peak established in the closing quarter of last year, the Commerce Department states in a review of the business situation.

Consumer demand, it says, was on the wane in the first two months of the year with retail sales off, wholesale prices lower, farm crops placed under government loan at an earlier date, manufacturers' stocks of finished goods rising and employment at the manufacturing level edging off.

Showing of the steel industry during the two month period is cause for favorable comment by the department. The industry's production performance during the period, the department says, was outstanding. Steel output in the two months totaled 15,600,000 net tons, or about 1,200,000 tons more than in the like period of 1948. This increase in production is seen as contributing materially to the easing in tight supply conditions for many consumers. On the basis of daily average output, steel production in the two months was at an annual rate of 96 million tons.

More Workers Seeking Jobs

MORE workers are looking for jobs than a month ago, and unemployment may rise further before the seasonal spring upturn in business definitely turns the tide. However, overall employment, in excess of 57 million by latest official estimate, rejects the gloomy view that things in general have gone, or are going, to pot.

NO STRIKE HERE: Trucks line up at Panther Creek mine near Springfield, Ill., for coal dug by the Progressive Miners of America, who were not affected by John L. Lewis' order for a two-week layoff by United Mine Workers. NEA photo

Considered from the negative side only, the picture is not pretty. It obviously is erroneous, however, to appraise the situation without relating unemployment to total employment. When this is done a markedly brighter scene is presented than that painted by the pessimists, with employment riding high on a plane considerably above anything experienced prewar, and holding only slightly below the inflated levels of the war and immediate postwar period.

Unemployment Up—Currently, unemployment is estimated at around 3,500,000, up about 300,000 from mid-February. However, nonfarm employment in mid-February was only 300,000 below the level for February, 1948, according to the Bureau of Labor Statistics, and was substantially above the level reported for any other February on record.

The robust state of current employment is readily seen in a comparison of data for selected prewar and postwar years:

	*Employed	*Unemployed	Per cent Unemployed
1929	47.8	1.6	3.1
1933	39.0	12.8	24.7
1939	46.1	9.5	17.1
1940	47.9	8.1	14.5
1941	51.8	5.6	9.7
1947	59.5	2.1	3.5
1948	60.6	2.1	3.3
Dec., 1948	60.9	1.9	3.1
Jan., 1949	58.8	2.7	4.3
Feb., 1949	58.7	3.2	5.2
Mar., 1949	58.4	3.5	5.6

* In millions of persons. Data are from the President's Council of Economic Advisers.

In the light of these data the current high level employment provides a highly encouraging note in the present mixed business situation. Contributing further to the bright side is the fact government labor authorities now are predicting employment will recover much of the ground lost over recent months and will rise to the 60 million mark by July.

Nonseasonal Declines—Last week the Bureau of Labor Statistics reported that nonseasonal declines in a number of industries were responsible only in part for a drop of 370,000 in nonfarm employment during February. At the same time, Ewan Clague, chief of the bureau, said the larger than seasonal adjustments appeared to be slowing down.

April employment trends, according to Mr. Clague, will tell the story, adding that unemployment would be serious if a seasonal rise in jobs isn't experienced in that month. He said there is nothing in the situation yet to indicate that the seasonal rise will not be experienced.

In its statement on February employment, the Labor Statistics bureau pointed out that since the February report was prepared the rate of increase of new claims for unemployment benefits has tended to slacken somewhat, although there is as yet no significant downturn in claims. Since Feb. 12, the date of the last employment report, it is estimated the pool of unemployment compensation claims has increased by about 200,000. However, the turnover on the unemployment compensation rolls has been fairly rapid.

Jobless Pay Claims Decline

CONTINUED jobless pay claims, those of persons idle a full week or longer, dropped 39,000 during the week ended Mar. 12 to total 1,939,-

700. This was the first significant decline in continued claims since Jan. 1 when the total was 1,273,330.

Foundry Orders Lag

Jobbing shops generally operating below capacity. Captive plants working at higher rate

MOST small jobbing foundries are continuing at a low level of operations and do not hold out much hope for early improvement. Those serving appliance manufacturers, tool and die shops, railroad equipment manufacturers, mine car builders, and those making radiators, boilers and bath tubs are especially hard hit by the decline in demand.

In contrast, the captive foundries of the automotive companies and those making heavy steel mill equipment and ingot molds are operating at a high rate.

Prices of castings have been reduced by many shops in an effort to stimulate demand.

Materials Supplies Improve—Coincident with the slackening in new orders, the foundries have found that one of their former headaches—materials procurement—has about disappeared. Pig iron is in fairly easy supply and stocks of premium-priced material generally have been worked off. Quality of iron now being received generally is of higher grade.

Scrap prices have broken sharply and offerings are of good grade.

Most shops have reverted to a normal mix of pig iron and scrap as pig iron supplies have eased.

Coke supplies and quality also are better.

Castings Better—Improved quality of raw materials, combined with certain technological improvements, have resulted in a better grade of castings, according to many foundrymen.

Steel foundries in the Detroit areas find their order books slimmer. A tapering in heavy truck production has been an important reason. Detroit Steel Casting Co., which for a time was supplying conversion ingots, is reported to have laid off its entire force and closed up shop.

Demand Eases, 12 Furnaces Down

DECLINING demand for alloy steel, conversion ingots and lower grade silicon steels has prompted steel producers to shut down at least seven open hearths and five electric furnaces and to effect other reductions in operations.

Republic Steel Corp. has taken two open hearths and three electric furnaces out of production in the Canton-Massillon district as result of the lower demand for alloy steel.

Crucible Steel Co. of America has shut down two open hearths and one electric furnace at its Midland Works and reduced operations at Parks Works by 50 per cent for April. Reduction is necessitated by slackening in demand for conversion ingots by Deere & Co. and by Crucible, by easing demand for alloy bars and to permit repairs to the bar mills and installation of shearing and other strip mill equipment.

Allegheny Ludlum Steel Corp. has taken off two open hearths and one electric furnace at Brackenridge. A third open hearth was scheduled to go down over the week end for relining. Curtailment is attributed to decline in demand for lower grade motor, electrical and armature silicon steels.

Blast Furnace Output High

PIG iron production in February totaled 5,169,904 net tons; ferromanganese and spiegel output amounted to 53,505 net tons, for a total blast furnace production of 5,223,409 net tons. Operations in February averaged 96.5 per cent of capacity.

Production for the first two months of 1949 was 10,838,606 net tons of pig iron, 116,321 net tons of ferromanganese and spiegel for a total of 10,954,926 net tons, or 96.1 per cent of blast furnace capacity, according to the American Iron & Steel Institute.

Lake Ore Season Starts

Shippers anticipate 1949 movement of around 83 million tons from head of lakes

MARKING an unusually early opening of the Great Lakes ore fleet's season, some carriers were to depart at the end of last week for upper lake ports. Last year, the ore carriers' season opened the first week of April.

On Mar. 1, iron ore stocks at United States and Canadian furnaces and at Lake Erie docks totaled 24,981,208 gross tons, compared with 22,628,022 tons on that date last year, according to the Lake Superior Iron Ore Association, Cleveland.

Expect Big Movement—By getting the shipping season underway earlier this year, it is expected the fleet will carry as much ore this year as last, approximately 83 million tons, if favored with as good weather as prevailed last year.

While some lower lakes vessel traffic began moving two weeks ago, the movement to the icy upper lakes areas was held in abeyance until the ice committee of the Lake Carriers Association considered an ice report from the Coast Guard ice breaker *Mackinaw* last week. Although the mild winter had led observers to expect full-scale shipping by late March or early April, considerable doubt as to the opening was thrown into the picture at the last minute by cold weather.

Automobile carriers helped launch the 1949 *Great Lakes shipping season Mar.* 15 *in one of the earliest openings in recent years. Shown above are some Chevrolets, which were part of a shipment of* 250 *cars and trucks on the T. J. McCarthy, ready to sail from Detroit to Cleveland*

Autos Lead in Steel Consumption

Data for 1948 show motor car industry continued in first place as consumer. Total movement of finished steel in year reported at 66,140,456 tons against 63,057,150 in1947

AUTOMOTIVE industry was the largest consumer of steel in 1948, just as it was in 1947. Steel production was record-breaking for peacetime last year and the auto industry's share of total output, 10,156,605 net tons, was up substantially from its receipts of 9,273,363 tons the preceding year, data compiled by the American Iron & Steel Institute show.

Of total shipments of 66,140,456 net tons of finished steel to all consuming classifications last year, 15.4 per cent went to the automotive field, as against 14.7 per cent of total shipments of 63,057,150 tons in 1947.

As a steel consumer, the construction industry, including maintenance, continued in second place in 1948, receiving 7,327,783 tons, compared with 6,257,559 tons in 1947.

Containers Third—The container industry barely remained in third place as a consumer of finished steel in 1948, when it received 5,291,028 net tons. A close runner-up was rail transportation, which took 5,219,723 tons and ranked in fourth place. In 1947, the container classification received 5,076,170 tons and rail transportation, 4,879,879 tons.

Tonnage-wise, jobbers, dealers and distributors fared better in 1948 than in 1947. Their receipts in 1948 totaled 11,336,191 net tons, or 17.1 per cent of all finished steel shipped by mills, compared with 10,484,144 tons, or 16.6 per cent, in 1947.

Reflecting a decline in drilling activity, the amount of finished steel shipped to the oil and gas drilling industry declined from 930,731 net tons in 1947 to 732,298 tons last year.

On the other hand, the big expansion in oil and gas transmission lines is reflected in the jump in tonnage allotted to the oil and gas industries under the "construction" classification.

Those two large consumers received 2,143,658 tons directly from mills in 1948, compared with 1,320,140 in 1947. In addition, oil and gas industry jobbers got 1,433,791 tons in 1948, compared with 938,490 tons in 1947.

Exports Down—Finished steel exported by mills in 1948 declined to 3,256,087 net tons from 4,206,692 tons in 1947.

Mill shipments of steel for shipbuilding and marine equipment in 1948 were almost double those of 1947, the 1948 shipments totaling 649,527 net tons, compared with 337,961 tons the preceding year. The aircraft classification received 35,437 tons in 1948, compared with 39,231 tons in 1947, while ordnance and other military took 55,133 tons in 1948, compared with 56,908 tons in 1947.

Larger steel shipments were received last year by the following: Contractors' products, 2,494,258 tons against 2,243,399 in 1947; mining, 325,730 against 287,670; agricultural, 1,422,013 compared with 1,244,548; machinery, industrial equipment and tools, 3,051,574 against 2,031,719; appliances, utensils and cutlery, 1,962,799 against 1,564,722 tons; and, other domestic and commercial equipment, 1,689,651 tons compared with 1,680,259 tons the preceding year.

Declines were registered in the electrical machinery and equipment classification, which got 1,570,367 net tons in 1948 compared with 1,595,520 in 1947, and the unclassified group, which received 3,828,702 tons against 4,660,795 the year preceding.

Steel Distribution—1948

(All products, including carbon, alloy and stainless)

Market Classification	Net Tons
Converters and Processors..	10,225,023
Forgings (except automotive)	942,724
Bolts, Nuts, Rivets, Screws.	1,280,565
Jobbers, Dealers, Distributors	11,336,191
Construction, Maintenance..	7,327,783
Contractors' Products	2,494,258
Automotive	10,156,605
Rail Transportation	5,219,723
Shipbuilding, Marine Equipment	649,527
Aircraft	35,437
Oil and Gas Drilling.....	732,298
Mining, Quarrying, Lumbering	325,730
Agricultural	1,422,013
Machinery, Industrial Equip., Tools	3,051,574
Electrical Machinery and Equipment	1,570,367
Appliances, Utensils, Cutlery	1,962,799
Other Domestic and Commercial Equip.	1,689,651
Containers	5,291,028
Ordnance, Other Military ..	55,133
Export	3,256,087
Unclassified	3,828,702
Total	72,853,218
*Less shipments to members of industry for conversion	6,712,762
Net Total	66,140,456

* All of these shipments were made to the group classified as "Converters and Processors."

Oil Company Will Appeal

HITTING at the U. S. Circuit Court of Appeals decision which upheld a Federal Trade Commission order against price discrimination in the Detroit area (STEEL, Mar. 21, p. 62), Thomas E. Sutherland, general counsel for Standard Oil Co. (Indiana) announced that the firm would appeal the decision to the Supreme Court. He pointed out that implications of this decision indicate a sharp blow to the competitive system of doing business as far-reaching and damaging to business and the public as was the Cement Case.

Mr. Sutherland further said: "It is difficult for us to see how the competitive system can continue to exist if a business man is prohibited from meeting his competitors' prices.

"The government attitude seems to be unfathomable. On one hand we have laws to promote competition, and on the other, we have laws and commission regulations which more and more closely limit the possible methods of competition. The public is inevitably the loser in such a situation."

Liberia Mining Setup Clarified

LIBERIA Mining Co., in which Republic Steel Corp., Cleveland, has acquired a stock interest, is a distinct and separate company unrelated to another firm known as the Liberia Co., according to a statement issued last week by Republic and Lansdell K. Christie, New York. The two companies have been confused in the public mind by recent press reports concerning Republic's plans for developing iron ore deposits in Liberia, West Africa.

The Liberia Mining Co. has been developing iron ore properties in Liberia for the past two years. At the same time there is in existence a firm known as the Liberia Co. headed by Edward R. Stettinius, which owns a small stock interest in the Liberia Mining Co. The latter company was formed in 1946 and preceded by some two years formation of the Liberia Co. Liberia Mining was organized and the concessions covering the iron ore properties it controls were granted to Lansdell K. Christie, who is president of the firm.

Upon completion of the transaction between Republic Steel and Liberia Mining more than 80 per cent of the stock of the latter will be owned by Republic and Mr. Christie.

Steel Export Quotas May Be Raised

Controls to be continued for security reasons, even after steel supply and demand reach balance. Foreign producers becoming more active in export markets

STEEL export quotas soon may be increased, although controls over shipments to foreign countries are likely to be retained for strategic and security reasons for a long time to come.

Exporters currently are not shipping all the steel for which they hold licenses. Applications for licenses, however, continue to exceed quotas.

The drop in actual exports during 1948 is attributed to improved production in some foreign countries, to widespread dollar shortages, and to stringent exchange and import controls effected by those countries.

Loans and grants made available by the United States under the European Recovery Program are expected to be reflected in increased steel shipments to participating countries this year.

European Exports Increase — Government officials in charge of foreign trade are faced with a dilemna in regulating exports. They want to prevent this essential material from flowing to unfriendly countries, protect this country's security interests, and avoid criticism about large steel exports at a time when domestic consumers are unable to obtain all they need. On the other hand, they do not want to abandon the export market.

Particularly are they concerned over the decline in shipments during 1948 to Latin American countries. This market took only 1.6 million tons during 1948, compared with 2.5 million tons in 1947.

European steel producers are more active in the export market. Belgium is providing competition in many overseas markets. Premium prices are vanishing. European exchange juggling has enabled some foreign sellers to knock down their prices to United States levels.

Recognize Competitive Situation— Future export controls, according to Wilson Sweeney, chief of the metals and minerals branch, Office of International Trade, will be geared to meet the competitive conditions. Faster action on export applications will enable American exporters to make faster deliveries to foreign buyers and will be at least one answer to foreign competition.

Mr. Sweeney stressed that national security prevents total decontrol of anything as strategically important as steel. This would be true even when supply and demand come into balance.

Controls To Continue — Secretary of Commerce Charles Sawyer also emphasizes that controls are likely to be needed for an indefinite period.

Virtually all steel products now are under export control, Mr. Sawyer said.

While the end of 1948 saw steel available for domestic consumption at an annual rate of 10 million tons more than in 1947, Secretary Sawyer pointed out that "steel shortages, particularly of flat-rolled and tubular products, continue to be serious."

"Export and other controls authorized by the Second Decontrol Act are needed as an integral part of the President's program to protect the domestic economy, and help fulfill our international responsibilities.

"While these controls are of limited scope, they have important implications for our domestic and foreign policy, and our national security."

Consider Copper Export Quotas

ESTABLISHMENT of quotas, on a quantity basis, for export of all copper or copper products, regardless whether they are domestic or foreign in origin, is under consideration by the Office of International Trade.

The Senate has passed a bill previously passed by the House, continuing suspension of import duties on copper. However, export control authorities have experienced increasing difficulty, it is learned, in distinguishing between domestic and foreign copper, for control purposes. It has been the policy to virtually ban export of refined copper of domestic origin. No licenses were issued throughout 1948 for export of such refined copper. On the other hand, no quantitative ceilings have been placed hitherto, on export of copper produced from ores of foreign origin.

Segregation Difficult—Recent experience has indicated that it frequently is not possible to distinguish between copper produced from domestic ores and that produced from foreign ores, particularly when the sale of the material is two or three times removed from the refiner, control authorities state.

The fact that Congress suspended import duties in 1947, it is said, has further complicated the question of identifying the two categories, as under the former system, copper was refined in bond for re-export, thus making identification fairly easy.

Hence, it is expected, some quantitative limits on copper exports as such, may be ordered.

The Senate action continues this exemption of certain import levies on copper for an additional one-year period from Mar. 31, 1949. The one-

ECA AIDING INDUSTRY: Reconstruction at the Aquila refinery at Trieste is speeded under a $4 million grant from the Economic Cooperation Administration, and the plant is picking up production again. Before the war, it supplied Italy with 60 per cent of its lubricating oils. It is expected soon to be able to supply Austria, Germany and the Balkans as well as Italy. NEA photo

year limit was inserted as an amendment, the House bill providing two years. This will involve an adjustment by conferees between the two bills.

Another amendment excludes copper sulphate from the benefits of the bill, on the ground that it has been found that certain copper products were coming into the United States under the exemption, in a form to be readily used as castings without further fabrication. Some Senators objected to this practice.

Lead and zinc are not included in the bill.

Public Construction Up

Government work rises in ratio to private building. Disposition to bolster employment

WHILE public work has dominated structural activity for some time, the ratio of increase to private building is steadily rising, indicating, in the opinion of some fabricators, a disposition on the part of government agencies to bolster sagging employment.

Boom in state construction work to the tune of millions of dollars is expected to get under way in New York state in the near future. Overall program involves $800 million. However, since the end of the war approximately $200 million of the total has been let. Shortages of materials delayed other work.

To Push Projects—"We plan to push all projects throughout the state as rapidly as we can," declared Bertram D. Tallamy, New York state superintendent of public works. "We have checked with the construction industry and we find in the present situation it is desirable to get as much work under way as possible."

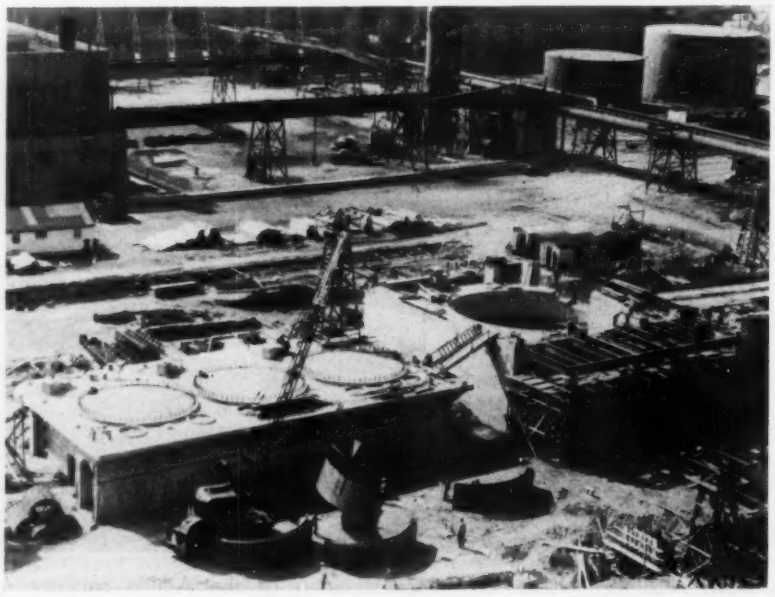
Work will move as far ahead of schedule as possible this year on several big projects in the Buffalo area, according to Mr. Tallamy.

Breakdown of figures for the entire state is not yet possible, but it is estimated that allocations for western New York run to $21 million in highway, thruway and grade crossing elimination work, $10 million for housing projects, and about $4.6 million for construction and improvements at state-owned institutions.

Conditions More Favorable—Building conditions, admittedly, are becoming more favorable. Supplies are more plentiful, and costs of some raw materials have gone down and this also applies to plumbing fixtures and to certain types of hardware and other building components. This has undoubtedly stimulated public construction in various cases. Yet it has not been sufficient to check the general decline in private work.

All this tends to add weight to the theory that the provision of new jobs is an increasingly important consideration in the expansion of public work at this time, even admitting that much of the new construction is desirable.

Governed By Costs—Private work in general is governed more closely by costs than public work, and probably one reason why the former has not been stimulated by lower costs so far is the fact that still lower costs may soon be in prospect. Another reason, with particular respect to offices and apartments, is the matter of rent controls.



NEW FONTANA FURNACE: Construction is moving rapidly on a second blast furnace for Kaiser Co. Inc. at Fontana, Calif. Foundations are complete for three stoves, at left. At right is foundation for the furnace itself. Ground was broken in December, 1948; furnace operations are to begin in December, 1949

Pittsburgh Public Work Gains

STRUCTURAL fabricators at Pittsburgh note a slight improvement in structural steel inquiries for public construction programs, due primarily to seasonal factors and not in any way related to efforts on part of government officials to offset increased industrial unemployment of recent months.

No figures are available as to the dollar valuation of municipal and state public works construction programs scheduled this year for the Pittsburgh area. However, trade authorities believe volume of this type work is moderately above that scheduled in 1948. This is attributed to somewhat easier steel supply situation.

Waste Dealers Urge Conservation

RECKLESS expenditure of natural resources when scrap is readily available is a crime against our future generations, Sidney M. Danzinger, Kramer & Co., and president, National Association of Waste Material Dealers Inc., declared in the keynote address before the group's 36th annual convention in Chicago last week.

Citing that the equivalent of a ton of iron scrap is 5 tons of ore, coal and limestone, that a ton of copper scrap equals 50 tons of copper mined from the ground, and that a ton of waste paper is the equivalent of 12 trees, he said: "We must impress upon the public that conservation's greatest ally is the waste material industry."

Elected as officers for the coming year were: President, James T. Flannery, James T. Flannery Co., Jersey City, N. J.; vice presidents, Harris Goldman, Harris Goldman Co., New York, Henry Lipkowitz, Atlas Metal Co., Cleveland, and Joseph M. Viener, Hyman Viener & Sons Co., Richmond, Va.

Copperweld President Dies

S. E. BRAMER, president, Copperweld Steel Co., Warren, O., died Mar. 24, of a heart attack in Palm Beach, Fla.

Look to South America

Hopefully as market for U. S. machine tools. Numerous hurdles must be surmounted

MACHINE tool builders are looking hopefully to South America for business to take up some of the slack which has developed in the domestic market since the end of the war, but according to a midwestern dealer who has just returned from his second tour of industrial cities in South America there are a number of hurdles that must be surmounted before sizable business is entertained.

Lack of technical know-how is a major obstacle in the way of industrial development of South American nations, this observer said. In the machine tool field this means that training of management to buy the right tool for the job is necessary as well as the training of personnel to operate and maintain the equipment.

Purchase Standard Tools — Many South American purchasers of machine tools fail to achieve the high level of production possible in U. S. shops because they do not get the equipment best suited to their needs. They have a tendency to purchase standard tools and shy away from special purpose machinery which would be more suitable and in the long run more economical.

Other factors such as import restrictions and currency difficulties also act to deter sales of American machines. Argentina, which is more developed industrially than any other South American nation, buys fewer machine tools in the U. S. than would be the case if her trade balance with this country were more favorable. The result is that Argentina has been purchasing European machine tools in increasing volume and shipping agricultural products to pay for the equipment, Italy, particularly, participates in these arrangements.

Exports of American-built machine tools to South American nations for the three postwar years were as follows: 1946, $8.9 million; 1947, $13.8 million; and the first nine months of 1948, $7 million. Total U. S. tool production now averages over $300 million yearly.

Machine Tool Orders Decline

ALTHOUGH February's index of total new orders compiled by National Machine Tool Builders' Association, Cleveland, fell short of January's mark, foreign orders were at the highest level since July, 1946. Index of new orders was 81 in February, a decline of six points from 87 in January. Foreign orders index (included in total new orders) climbed to 26.6 in February from 21.9 the preceding month.

Shipments index made a small advance to 70.4 in February from 68.8 in January. Ratio of unfilled orders to shipments at the end of February was 4.7 to 1 as compared with 4.6 to 1 a month earlier. All of the index figures used by the association are based on average monthly shipments for 1945-1947 being equal to 100.

Improvement in foreign orders was due to an increased volume of business under the European Recovery Program and an upswing in sales by Canadian dealers. About $50 million was appropriated for machine tools under ERP for this fiscal year and, according to industry estimates, the bulk of this sum has been spent. For the coming fiscal year this appropriation will be increased to about $75 million.

KEEPING POSTED: Machine tool salesmen of Brown & Sharpe Mfg. Co. attended a four-day conference at the company's Providence, R. I., plant to get first-hand knowledge about most recent designs of machine tools and sales promotion and advertising programs undertaken by the company to extend sales of its varied line of products

Warner & Swasey Reports Gains

ADDITION of new products outside the conventional machine tool line in 1948 enabled Warner & Swasey Co., Cleveland, to report a profit for the year after two years of operating at a loss.

Important additions to the company's line in 1948 were a pin drafting machine and a convertor for the textile industry and the Gradall, an excavating machine adapted to certain types of grading, ditching and excavating work. In the machine tool line new products included single and multiple spindle automatics and electro-cycle turret lathes and tapping machines.

Net income for 1948 was $573,041 on sales totaling $18,775,061. Sales of products other than machine tools aggregated $6,905,013 in 1948, a large increase both in dollars and percentage of total over preceding years. Operating losses of $297,387 and $162,109 were reported in 1947 and 1946, respectively.

Warner & Swasey employees have been on strike since Dec. 27, 1948, over a union demand for an increase of 19 cents per hour in the base rate. The company is offering wages above the average in the community.

Monarch Backlogs Improve

MONARCH Machine Tool Co., Sidney, O., reports that its backlog at the end of 1948 increased to $1,675,000 from $1,230,000 at the close of 1947. To keep its plant in operating condition the company received new equipment worth $240,328 during the year without adding to its productive capacity.

A small decline was experienced by Monarch both in shipments and in net income. Shipments in 1948 were $8,572,275 as compared with $8,616,428 in the preceding year and net income similarly declined to $639,822 from $667,457.

Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

Keyserling, in letter to editor of Washington newspaper, restates his position that the government should intervene in the production situation by expanding facilities

ONE of the chief administration economic soothsayers, Leon Keyserling, took occasion a few days ago to restate his belief that the government should intervene in the production situation by expanding facilities of its own. Inferentially, rather than in direct language, he meant steel and other metals.

Commenting on editorial criticism in a Washington newspaper, Mr. Keyserling, in a lengthy letter to the editor, denied his "argument for expanding certain industrial facilities rests upon my failure to perceive that some demand may be falling off."

Restates Position—Even if it is, Mr. Keyserling said in effect, "my view has been clearly stated that our national and international interests require us to make maximum use of our productive potential by working toward the effective operation of our distributive system, instead of allowing supply to scale downward toward a decreasing level of demand."

That way he argues, "is the road toward a stagnant economy."

However, the *Washington Post*, ordinarily strongly liberal in its editorial comment, took exception to a recent statement attributed to President Truman that only farm prices had dropped and metal prices are still spiraling.

"Evidence to the contrary is there for all to see," said the *Post*, and adds:

Index Outdated—"In an effort to bolster the President's position Mr. Keyserling cites an index of metal and metal products that is not up to date." The paper then raised the question, in relation to the demand for continued standby controls, and other features of the recent economic report, as to just how the various administration demands are justifiable.

Assuming the President were to be given standby controls, the paper asks, "What assurance is there that policies will be discriminating when the President emphasizes the danger of spiraling inflation at a time when prices of many industrial products are declining, and workers being laid off, while one of his chief economic advisors, Mr. Keyserling, insists that industrial capacity expansion is needed far in excess of that indicated by current or revealed business plans."

Evidently Mr. Keyserling is "prejudging the issue" of more steel capacity, the paper comments. While endorsing the proposed inquiry to determine if such expansion is necessary, the paper said it "certainly does not concur in Mr. Keyserling's view that the best way to avert a depression is to expand productive capacity in the face of declining demand."

The exchange is significant in view of Keyserling's accredited position in drafting much of the basic economic report recently issued by the Joint Economic Committee, after much reworking.

AEC Detours Around Coal

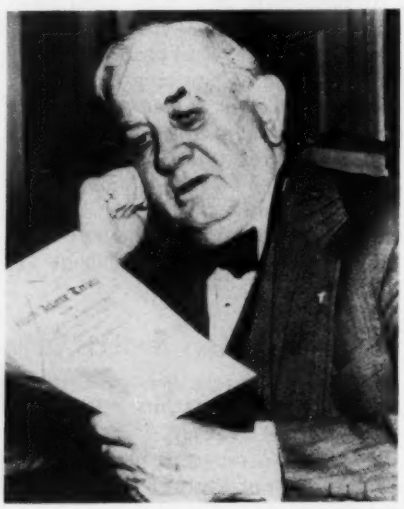
THE ATOMIC Energy Commission has quietly detoured its operations around John L. Lewis' coal. Warned by frequent interruptions to the coal supply, such as the present strike, the AEC has decided not to depend entirely on coal for fuel. Coal is too vulnerable to either rail or mine strikes.

It has come out that AEC's Oak Ridge plant plans to use 60 million cu ft daily of natural gas at its steam generating installations. This is considered to be the minimum to insure continuous operations at Oak Ridge. Eventually this supply will be expanded to 80 million cu ft per day

Incidentally, some major coal interests are very aroused over the situation. Members of Congress are expected to begin hearings on the matter, from coal-minded constituents. This further cut in the potential regular market for coal is not calculated to please the miners, either.

However, the AEC, without emphasizing its arrangements for gas, has made it clear to those who have protested so far, that the vital operations at Oak Ridge and elsewhere, cannot be left to chance interruptions. Completion of certain new gas pipelines in the recent past fortuitously suggested a backstop, so far as fuel is involved.

Included in the voluntary steel allocations program is 4750 net tons of steel pipe per month for the "Oak Ridge Pipe Line."



SEN. TOM CONNALLY

Chairman of the Senate Foreign Relations Committee, Senator Connally (Dem., Tex.) studies a copy of terms of the North Atlantic defense pact, the signing of which he predicted would be ratified promptly by the Senate. NEA photo

Government Construction Huge

MAGNITUDE of the government's share in construction activities today is indicated by the fact that 1949 appropriations for the purpose exceed $2.4 billion.

Completion of government works now in progress will require over four and half billion. Projects authorized by Congress, but not yet appropriated for, call for seven and a half billion more. Still other projects are on the horizon.

The scope of these operations lends emphasis to proposals by the recently-disbanded Hoover Commission, for some consolidation of these activities, and some effort to bring them under more closely knitted management.

Generally, the recommendations point to centering much of these activities in the Interior Department. Whether Congress will go along on this is problematical. Secretary of Interior Krug, as well as many of his subordinates, are not too popular around the halls of the capitol, for various reasons.

Another proposal, likely to get a more interested audience at the capitol, calls for a somewhat different division of the various activities, and was contained as a dissenting version of the main report. One phase of

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Submerged Melt WELDING Machines

The "McKay Submerged Melt Welding Machine" (as illustrated) was developed to provide precision control of the tube during the welding process. It is of extremely rugged design, thereby insuring continuous performance, with a minimum of maintenance.

The "SUBMERGED MELT WELDING PROCESS" (as illustrated) is used extensively for joining various types of metals. This process is particularly adaptable for longitudinal butt welding of heavy wall tubing, due to its many advantages, some of which are listed:

(a) One pass welds—possible in heavy wall thickness.

(b) Heavy welding currents (up to 4,000 Amps. or more) can be used.

(c) A.C. or D.C. welding current can be used.

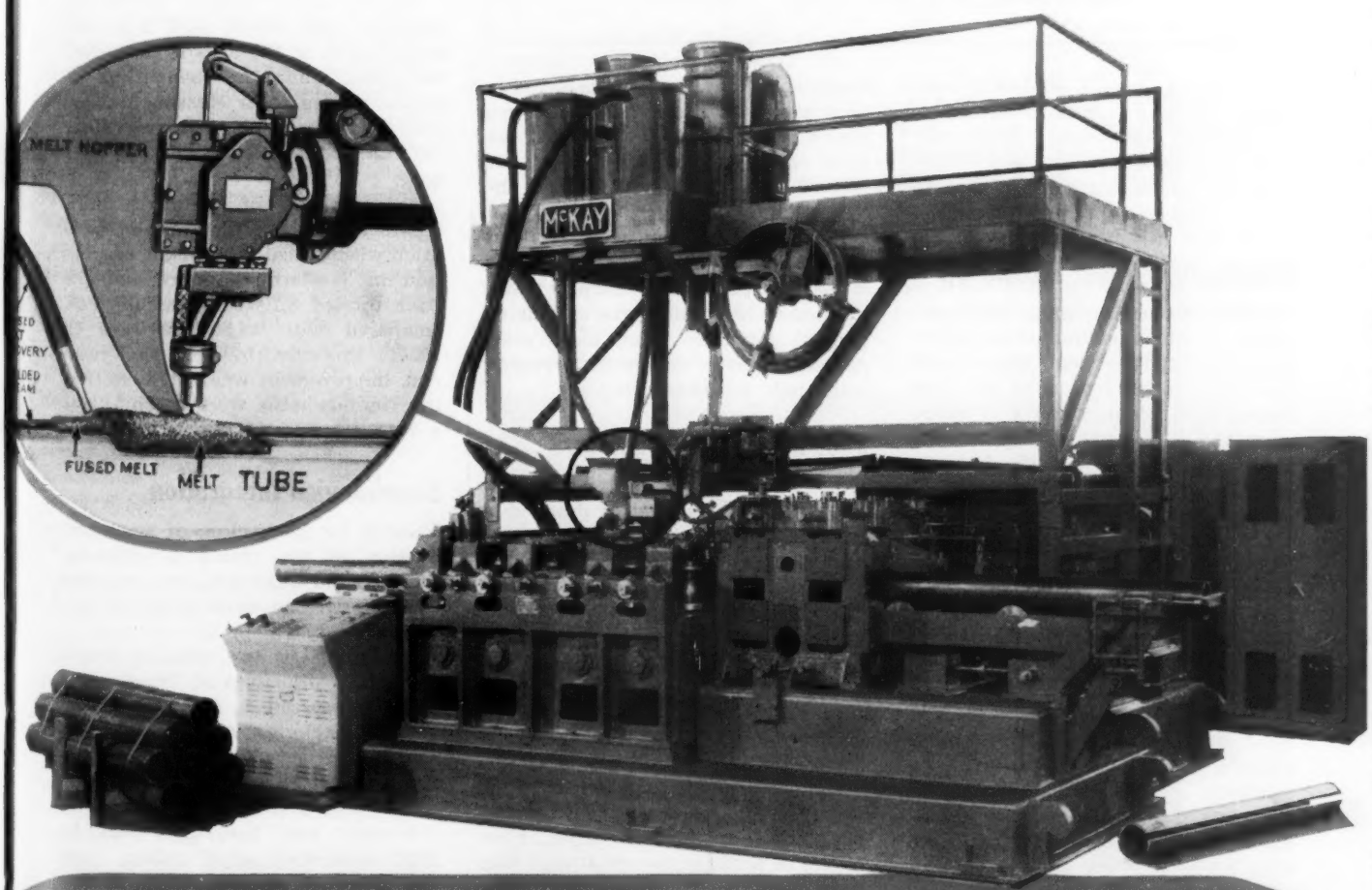
(d) Ferrous and non-ferrous metals can be welded.

(e) Weld quality is excellent—welds are smooth, clean and uniform.

(f) Very little weld metal is deposited.

(g) No metal loss from spatter or vaporization is encountered.

(h) Minimized distortion is a result of high speed, narrow weld zone, and concentrated heat.



The McKAY MACHINE Company

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

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MORE STRENGTH WANTED: Testifying before the Senate Armed Services Subcommittee, Secretary of the Army Kenneth C. Royall, left, asked for passage of a bill authorizing a 70-group Air Force and long-range planning by the Army and Air Force for the "chess-game" war. With him are Gen. Hoyt Vandenberg, center, head of the Air Force, and Gen. Omar Bradley, Army chief of staff. NEA photo

the dissenting report objects to centering building construction under the Interior Department. Other dissenting views also were more in line with the established political aspects of the situation.

Manufacturing Net Income Up

COMBINED net income of 1035 companies in the manufacturing industries was 20 per cent higher last year than in 1947 on a 15 per cent increase in dollar volume of sales, according to a tabulation by National City Bank of New York. This increase in the net income total occurred although only 57 per cent of the reporting companies had increases, against 43 per cent with decreases. About 6 per cent had actual deficits, even in a year regarded as so generally prosperous.

Groups showing the largest increases in net income as well as in sales included: Petroleum, iron and steel, automobiles and trucks, agricultural implements, household appliances, cement and other building materials and chemical products. In a number of other groups where supply was catching up with demand and sales expansion was tapering off, earnings of many leading companies were substantially lower.

Special reserves were set up out of earnings by some firms to provide for increase in future costs of replacing plant and equipment over the normal depreciation charges based on original costs or for possible losses on inventories or general contingencies. In some cases these reserves were treated as deductions from earnings and thus had the effect of reducing the reported net income.

In others they were treated as appropriations of reported net income, representing surplus earmarked to be retained for specific or general purposes. For most companies, however, no special provision was made for these purposes.

Sees Slump in Freight Cars

DOWNTREND in freight carloadings and in railroad earnings will adversely affect the demand for new freight cars in the opinion of the Commerce Department, despite the fact that carriers still have many freight cars which are over the prewar retirement age.

Car builders have cut deeply into their backlogs from a high of 135,000 units in April, 1948, when they represented 13 months' shipments, to 86,000 at the end of February or eight and a half months' shipments at the production rate for that month. New orders in the first two months of this year were down considerably from the monthly averages for the preceding two years (STEEL, Mar. 14, p. 57).

Last year outlays by class 1 railroads for rolling stock totaled $320 million, an increase of about two-thirds over 1947. In the first quarter of this year, the Commerce Department expects the total will be nearly $300 million.

Some Export Controls Removed

EXPORT controls on certain antimony, bismuth, lead and lead chemicals have been removed, subject to destination, in an action by the Office of International Trade. In some instances, controls were only modified.

Easing of restrictions, it was stated, is due to improved supplies, as well as a declining foreign market for these materials incident to lack of dollar-exchange.

Soviet Policies Hit in Report

SOVIET reparations and plant dismantling policies in the occupied areas of Germany are hit in a report by the Foreign Policy Association.

The report stressed the difference between progress toward recovery in the western zones and that of the Soviet-dominated area.

Among other results of Soviet practices, the report said iron and steel output in the area is far below its quota, while the dismantling of plants, among other Russian tactics, "has made economic improvement difficult if not impossible" in that zone.

The secretary of commerce in a report touched on the German situation when he said that ingot production in Western Germany and the Saar totaled 6,700,000 tons in 1948, compared with 18,300,000 tons in 1937. However, towards the year-end, improvement was noted, so that the German mills were reaching for a rate of almost 9 million tons.

Scandinavian Integration

PLANS for integration of steel production in the plants of Norway, Sweden and Denmark, are reported by a Norwegian news source in this country.

According to the plan, it would follow the principles of the Benelux countries, so-called. The idea is still in the exploratory stage, it was said, but is scheduled for consideration at a meeting of representatives of the three countries in early April.

Norway now has under way its first large-scale steel rolling mill. One phase of the plan would involve co-operation of the three countries in rolled steel production, so that output in one area would supplement those in the others.

Scandinavia's requirements in rolled steel are estimated at about 2,300,000 tons yearly, where only 1 million tons are now produced.

Britain Mass Produces Craft Products

U. K. applying mass production methods to craft industries to maintain its world leadership in specialized categories like needles, lace machinery and lighthouse equipment

GREAT BRITAIN is applying mass production techniques to traditional craft industries in efforts to raise herself by her own economic bootstraps.

United Kingdom production of sewing needles, before the war at 750 million annually and trailing German and Japanese output, has now reached 1,350,000,000 per year and is still increasing. Britain today is the world's largest producer and by far the largest exporter. About 80 per cent of her output in 1948, valued at $2,800,000, was shipped overseas, principally to the United States which took more than 570 million.

Concentrated Industry—The industry is composed of 12 firms, of which 11 are in Redditch about 130 miles from London. Its present output is valued at $240,000 monthly and its 2000 workers use 30,000 tons of steel annually. Its greatly increased postwar production, 80 per cent more than prewar, has been made possible by a mechanical revolution, much of which has occurred since the war. Newest development in the field has been the construction of a plant by Needles Industries Ltd., the largest company in Britain, at Studley near Redditch which combines all manufacturing processes under one roof and which furthers a trend toward integration of all operations. Many companies in the field still have their wire drawn for them by outside sources.

The Studley plant will begin operating soon and is expected to put Britain in a more commanding position than ever to supply the bulk of the 8 million needles used annually in the world. Japanese output is reviving, but in Germany production is still a trickle. The industries in all three nations make knitting pins, crochet hooks, surgeons' needles and gramophone needles, as well as the standard sewing type.

Lace-Making Machinery—Still another industry that is shifting from craft to mechanized techniques is the lace-making machinery field which is now producing at the rate of $100,000 a month, about 55 per cent of which is for export. This industry comprises seven firms centered in Nottingham whose main business, upon which it has a virtual world monopoly, is the manufacture of replacement and modification parts for the machinery now in use all over the earth. This machinery is of three major types: Plain net lace machines, lace curtain machines and Lever's machines which are used to produce traditional dress laces. The industry since the war has developed a number of auxiliary parts and machines for lace makers which are becoming increasingly important in its production volume. Demand for all this apparatus is particularly strong in the United States, Switzerland and India.

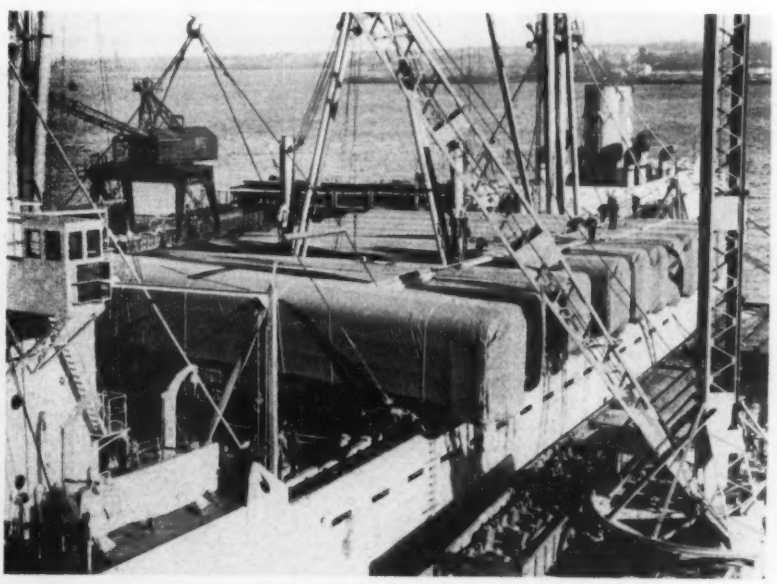
Another field where Britain is striving to improve its position, which is already one of world leadership, is in the manufacture of lighthouse equipment, including the production of optical apparatus, rotating and flashing mechanism, switchboard devices, generating plants and lanterns. Four U.K. firms are engaged in this work.

Western Germany

NEWLY created Reconstruction Finance Corp. of Bizonia has been capitalized with $120 million to invest in industry. The move is seen as a spur to recovery even though the funds thus far made available through counterpart funds are relatively small. The German RFC is expected to invest $51 million in power plants, $22.5 million in coal mines, $22.5 million in transportation and the remainder in miscellaneous projects.

The current mild recession is attributed largely to the terrific credit stringency which has been fostered by the Allied authorities as a check on rampant inflation. Industry, however, is now calling loudly for a loosening of the screws as unemployment is rising and order cancellations are more numerous. The situation is reflected in the changed composition of steel allotments. The proportion of total steel production assigned to makers of railroad equipment for the second quarter has been reduced from 20 per cent to 12 per cent because the German railways are unable to keep up maintenance and new orders. Many steel products, like heavy forgings and cold-rolled items, have been dropped entirely from allocations because they are now freely available. The railroad locomotive industry is maintaining itself through foreign orders, the largest of which was placed by India with Krauss-Maffei Ltd., Munich, for 100 express units.

The Ruhr steel industry has been hit by another round of rising costs. Coke has gone up $1.20 a ton and the subsidy on imported iron ore has



CARS FOR BRAZIL: A Norwegian freighter visits Philadelphia to take on the first 23 of 63 stainless steel railway passenger cars the Budd Co. is building for Central Railroad of Brazil. Six are lashed below the hatches and 17 covered with tarpaulins ride athwart the deck. At the pier, standard car trucks were replaced with wider trucks as used in Brazil

been removed, with the result that the monthly production expense has jumped by about $2.4 million. Since an increase in steel prices is out of the question, the Germans have asked for a boost in the export quota to 245,000 tons for March through June.

Belgium

BELGIAN metal working competition, both in domestic and export markets, is becoming keener.

A weakening in steel prices has dropped merchant bar quotations to $115 per metric ton f.o.b. Antwerp, structural steel from $127 per metric ton to $118, plates and sheets from $250 per ton to $135. The output of steel ingots and castings in Belgium in January was 370,090 metric tons against 363,900 tons in December. Luxemburg steel ingot and casting production, totaled 227,552 tons in January, against 243,010. Expectations are that this rate could be maintained throughout the year as raw material supplies are now very easy. Steel production is averaging about 8 per cent more than in the record 1929 and 33 per cent more than from 1936-1938. In the export market, rolled steel products are the most difficult to sell.

The outlook for the shipbuilders is now good, since several orders for tankers have been received. But ship repairers are now operating only at half capacity because of a new United States tax of 50 per cent imposed on repairs to U. S. vessels in Belgium. The tax is non-operative on emergency repairs.

British Foundry Team

Makes first of plant visitations on American tour in search of productivity "know-how"

A GROUP of 16 British foundrymen, which arrived in this country March 14 to study American industrial methods and equipment, with the idea of seeking out means for increasing productivity in the United Kingdom, left New York early last week for Milwaukee, where they will make the first of a number of plant visitations in the Middle West.

This is the first group to come to this country under the auspices of the Anglo-American Council on Productivity, sponsored by the Economic Cooperation Administration. Under the program now outlined, there will be about 35 British groups (referred to as productivity teams) visiting this country before the year is over. They will represent a wide diversity of industry on the other side. So far as can be learned, however, there will be no group representing steel.

Before leaving for the Middle West, the foundry team visited the Cooper Alloy Foundry Co., Hillside, N. J., said to be the world's largest foundry devoted exclusively to the casting of stainless steels, and headed by Harry A. Cooper, president.

Tour Cooper Plant—Highlights of the tour of the Hillside plant included inspection of methods, recently developed at Cooper Alloy, for casting stainless steel centrifugally in permanent metal molds, a demonstration showing the use of oxygen to obtain higher quality with greater economy, and an exhibition of modern core-blowing techniques.

On a previous day the group made its first plant inspection trip in this country, visiting the American Steel Foundries, Newark, N. J.

The team, consisting of six labor and four management representatives, plus six technicians, was headed by F. A. Martin, managing director, Osborn Foundry & Engineering Co. Ltd., Sheffield, England. C. Spencer Couchman, project manager, ECA, is accompanying the group at this time. The British foundrymen are scheduled to remain in this country until around Apr. 26.

Comprising the founders group, in addition to Mr. Martin, are J. W. Jackson, personal assistant to the executive director, English Steel Corp., Sheffield, and also team secretary; J. Jackson, technical director and assistant managing director, Jackson Elphick & Co., Lanarkshire; W. L. Hardy, foundry manager, Lake & Eliot, Essex; and R. MacNab, foundry manager, Clyde Alloy Co., Scotland.

Also included are: D. Colbridge, chief methods and time study engineer, David Brown Foundries Co., Yorks; E. Daybell, chief methods engineer, K. & L. Steelfounders, Hertfordshire; D. H. Aston, chief cost accountant, F. H. Lloyd Ltd., Wolverhampton; S. Taylor, chief foundry estimator, English Steel Corp.; H. J. L. Ray, supervisor, heavy dressing, Staffordshire; W. Hammond, foreman molder, Sheffield; T. H. Lamb, charge hand molder, County Durham; W. Scott, steel molder, Scotland; H. W. Taylor, molder, Sheffield, B. Travis, molder, Sheffield; and L. Skidmore, pattern maker, Hertfordshire.

Carl J. Jernstrom and H. C. Cooper of Cooper Alloy Foundry Co. explain details about centrifugal casting methods to British foundrymen in this country to study U. S. methods. From left to right: H. W. Taylor, molder; B. Travis, molder; Mr. Cooper; Mr. Jernstrom; T. H. Lamb, charge hand molder

U.S. Now Chief Bearings Maker

UNITED STATES, once dependent on foreign sources for most of its ball and roller bearings, now is a leading supplier of antifriction equipment to the rest of the world.

About 10 per cent of the nation's output of bearings, according to William L. Batt, president of SKF Industries Inc., is going into foreign markets. The bearing industry, now operating at a rate of more than $300 million a year as compared to $95 million in 1939, exported more than $21 million worth of bearings of all types and sizes in the first nine months of 1948. The bulk of these shipments went to Canada and Great Britain.

Great Britain and Canada alone,

accounted for more than $9 million of U. S. exports. They were followed, in order, by Argentina, the Netherlands, Australia, Belgium, India, Switzerland, Mexico and Sweden.

Expects Scrap Piling

Trade leader sees dealers accumulating tonnage with generation now exceeding demand

SCANTY buying of iron and steel scrap by steel mills and foundries at a rate evidently lower than current generation of material will lead to a revival of one of the primary functions of the scrap dealer, that of piling scrap, said Edwin C. Barringer, executive vice president, Institute of Scrap Iron & Steel Inc., in an address, Mar. 21, before the northern Ohio chapter of the institute at Cleveland.

"A service that no other organization can render consumers of scrap is the accumulation of inventories that make possible prompt shipment of scrap when consumers return to the market in force," said Mr. Barringer. "Dealers will be in the market to buy scrap as it arises, at a price consistent with the necessity for laying it down and holding it for an indefinite period.

"Prior to World War II dealers sometimes had as much as 2 million gross tons of scrap in their yards. Currently, according to the U. S. Bureau of Mines, dealers' stocks are less than 200,000 tons. It may be that dealers are at the start of a cycle of accumulation. This function of carrying inventories, especially for foundries, is a peculiarly valuable one, rendered only by the dealer."

Because dealers' yards are bare and the spring upswing will be on a greatly reduced basis this year owing to the mild winter, consumers should not remain aloof from the market too long, Mr. Barringer cautioned. Some important sources of scrap in 1948, such as shipbreaking and government surplus, are nonrecurring, he pointed out. Lower prices will not attract as many collectors as last year's levels, thereby probably reducing the intake of dealers.

Discuss Ways of Boosting Sales

PRESENCE of a buyers' market was evident in discussions at the conference on marketing of the American Management Association at the Hotel Statler, New York, Mar. 17-18.

Methods of revitalizing sales forces, utilizing market research, sales promotion techniques and determination of pricing policy were all examined in the light of current conditions requiring greater activity to get and keep customers.

F. R. Ficken, manager, marketing research, Esso Standard Co., New York, pointed out the value of market research to his company although the results at times were hard to believe because they were contrary to preconceived ideas. This technique was applied not only to the desires of customers but to the study of coverage by sales personnel with the results that coverage by salesmen has been improved.

Kenneth R. Beardslee, vice president in charge of sales, Carboloy Co., Detroit, explained that his company was not caught unaware by the drop in business. Methods used to revitalize sales were realignment of the sales force so that each man specializes in one type of selling and having all men in one area work as a team, increasing number of dealer outlets and providing a distributor training program.

To get good methods of pricing requires analysis and research, stated Dr. Joel P. Dean, Columbia University, New York. To be successful, a company's price policy must be tuned to its competitive environment, he said, particularly in a period of recession.

Explains Patent Licensing

IN ORDER to clarify erroneous ideas in the minds of many manufacturers and the public about legal interpretations in regard to patent licensing, Machinery & Allied Products Institute, Chicago, has issued a pamphlet explaining permissible procedures in patent licensing. The institute explains that since a license does not prevent the licensee from doing anything he might do without it, restrictions in the agreement are proper except where they extend beyond the scope of the patent and thereby violate antitrust laws.

Recent court decisions have affirmed the following rights of the patent owner:

Royalty—Except in time of emergency, the patent owner may charge what he pleases.

Field of Use—The patent holder may stipulate the purpose for which a licensee may use his invention, or the manner in which he may use it.

Territory—The patent owner may restrict the geographical area in which the licensee sells a product made under his patent.

Quantity—The amount or percentage of total output under the patent may be limited by the patent owner in a licensing contract.

Number of licensees—The patent owner may license or refuse to license an applicant as he sees fit.

Sale Price—Although this issue is the most controversial, the courts have repeatedly held that a patent owner may stipulate the price under which a licensee sells a product manufactured under his patent.

Calendar of Meetings

Mar. 28-30, Society of Automotive Engineers: National transportation meeting, Hotel Statler, Cleveland. Society headquarters are at 29 W. 39th St., New York.

Mar. 28-Apr. 1, American Chemical Society: 115th national meeting, on sour crude oil, San Francisco.

Mar. 30-Apr. 1, Institute of Metals: Annual general meeting at Institution of Mechanical Engineers, London.

Apr. 3-6, National Screw Machine Products Association: Annual meeting, Hotel Somerset, Boston. Association headquarters are at 13210 Shaker Sq., Cleveland.

Apr. 4-6, National Sanitary Supply Association: First institute of sanitation and modern cleaning methods, Hotel Sherman, Chicago. Press headquarters for the association are at 220 S. State St., Chicago.

Apr. 5-6, Metal Powder Association: Fifth annual meeting and exhibit. Drake Hotel, Chicago. Association headquarters are at 420 Lexington Ave., New York.

Apr. 5-7, American Gas Association: Sales conference on industrial and commercial gas, Andrew Jackson Hotel, Nashville, Tenn. Association headquarters are at 420 Lexington Ave., New York.

Apr. 6, Detroit Chapter of American Foundrymen's Society: Congress of foundry experience, Rackham Memorial Bldg., Detroit.

Apr. 10-17, General Motors Corp.: Transportation show, Convention Hall, Detroit.

Apr. 11-12, American Machine Tool Distributors Association: Meeting, Hotel Oglethorpe, Savannah, Ga.

Apr. 11-12, American Zinc Institute: 31st annual meeting, Hotel Statler, St. Louis. Institute's Galvanizers Committee will meet concurrently with the general convention. Institute headquarters are at 60 E. 42nd St., New York.

Apr. 11-12, American Institute of Electrical Engineers: Conference on industrial application of electron tubes, Hotel Statler, Buffalo. Institute headquarters are at 33 W. 39th St., New York.

Apr. 11-13, American Society of Lubrication Engineers: Annual convention, Hotel Statler, New York. Lubrication show will run concurrently with the convention.

Apr. 11-14, National Association of Corrosion Engineers: Fifth annual conference and exhibition, Netherland-Plaza Hotel, Cincinnati. Association headquarters are at 905 Southern Standard Bldg., Houston.

Apr. 11-15, American Society for Metals: Western metal congress and exposition, Shrine Civic Auditorium, Los Angeles. Society headquarters are at 7301 Euclid Ave., Cleveland.

Apr. 18-20, Open Hearth Steel Committee and Blast Furnace, Coke Oven and Raw Materials Committee, Iron & Steel Div., AIME: Thirty-second annual conference, Palmer House, Chicago. Institute headquarters are at 29 W. 39th St., New York.

Apr. 18-20, Illinois Institute of Technology: Eleventh annual Midwest power conference, Sherman Hotel, Chicago. Conference is also sponsored by many other institutions.

Apr. 19-20, Magnesium Association: Annual spring meeting and product exhibit, Edgewater Beach Hotel, Chicago.

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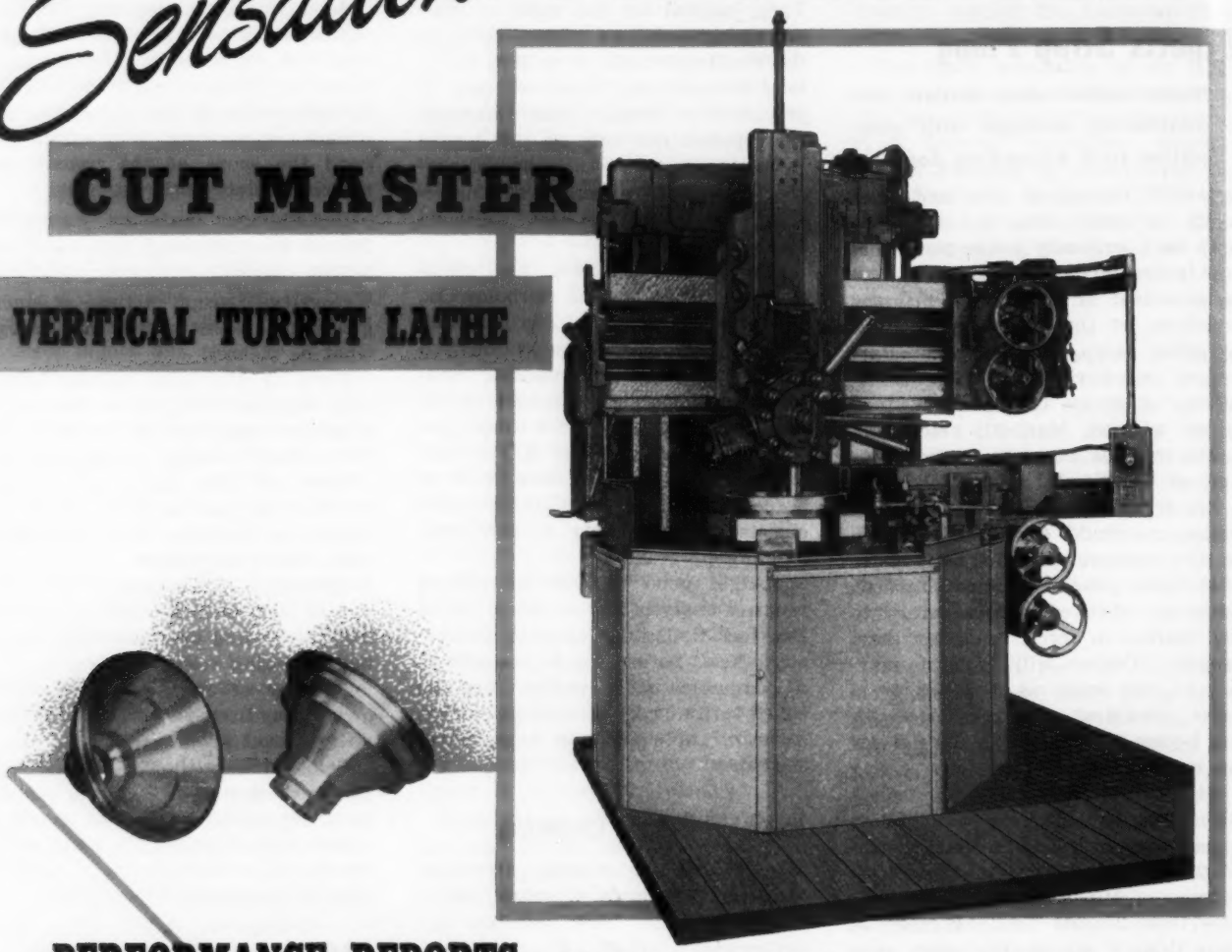

PERFORMANCE REPORTS... 64" Cut Master on wheel job cuts time from 24 hours to 7 hours. — A new method of tooling and the speeds available on a 42" Cut Master cut floor to floor time from 1 hr. 50 minutes to 38 minutes. — Another 42" Cut Master cut job time from 1 hour 40 minutes to 23 minutes. — and yet another 42" machine improves over former method on endshields. Previously 1 piece required 1 hour 40 minutes. Now two shields are completed every 40 minutes. Let Bullard figure your jobs on Cut Master Vertical Turret Lathes. **The Bullard Company, Bridgeport 2, Connecticut.**

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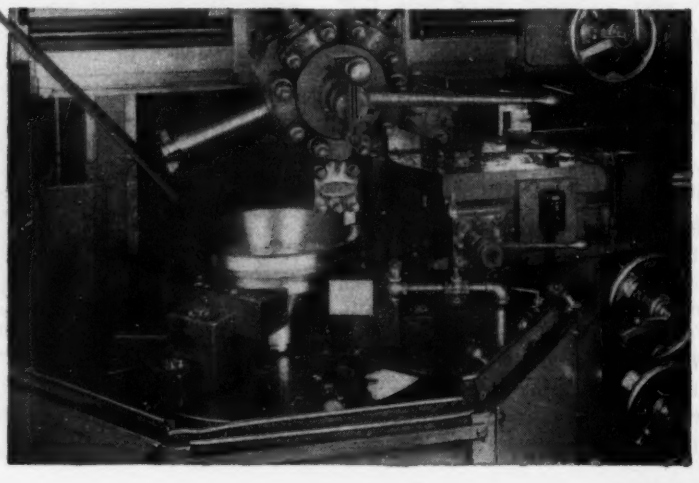

In 3 chuckings, 380 lbs. of stock was removed in 14¼ hours from a stainless steel forging of this bowl shell. Such an excellent finish was obtained, that a previous polishing operation was eliminated.

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Decision awaited on allegedly discriminatory freight rates charged by railroads on assembled cars as against lower rates for parts shipments to Ford and GM assembly plants

DETROIT

A BONE of contention since 1931 and in process of review by the Interstate Commerce Commission since 1939, allegedly discriminatory freight rates on finished automobiles have come up for a final hearing before the ICC, with a decision expected soon.

Chrysler, Hudson, Nash, Packard, Studebaker and Willys-Overland, joined for a time by Kaiser-Frazer, are the complainants seeking relief from the higher rates charged by railroads on cars built in their plants, as against shipments from geographically scattered assembly plants operated by General Motors and Ford. Some of the legal experts who have been working for years on the complaint are pessimistic over the possibilities of any relief, feeling they are battling powerful interests who can steer a decision away from the real merits of their case.

Standard distance scales for freight rates are called the first class rates. From assembly plants to shipping points, rates are from 25 to 40 per cent of the first-class rates for the distances. From Detroit, Toledo, South Bend and Kenosha, on the other hand, to destinations, rates are as much as 85 per cent of first-class, and until a slight relaxing on the part of the ICC a few years ago, 100 per cent of first-class was assessed.

Blame Truck Competition — The only explanation the railroads have offered is that the lower rates from assembly plants were necessary to meet the inroads of truck competition which is claimed not to affect shipments from central plant cities to an equal extent. The argument is of doubtful validity, since Chrysler, for instance, has been shipping only 25 per cent of its passenger cars by rail, the rest going by boat and haulaway truck. Actually, truck lines usually set their rates slightly below those of rail carriers, so the maintenance of high rail rates from central plant cities has served to keep truck rates from these points proportionately high.

Increases on Percentage Basis—To make matters worse, the recent wave of freight rate increases has been entirely on a percentage basis which forces the high rates up disproportionately in terms of dollars compared with the lower rates on auto shipments from assembly plants.

Citing specific cases which doubtless show up the disparity to particularly good advantage, rates on autos shipped from Detroit to Atlanta, Ga., are 43 per cent above the 1929 level, while rates from Atlanta (where GM and Ford have assembly plants) to Birmingham are 45 per cent below the 1929 level. Again, on autos shipped from Kenosha, Wis., to Pittsburgh, rates are 52 per cent above 1935, while shipments from Baltimore are down 18 per cent.

When GM spokesmen were asked for their side of the story, they declined comment on the grounds the complaint was none of their affair, being confined solely to the petitioners and the railroads. For GM and Ford it can be pointed out, of course, that in the overall freight costs incurred in delivering automobiles, assembled at scattered points, consideration must be given to the tariffs involved in shipping body sections, fenders, engines, frames and other components from the points of manufacture to assembly. Obviously, these costs are considerably less than shipping completed cars which is, in fact, the reason for establishing branch assembly plants. Beyond that, it is logical to expect railroads doing a large business in delivering materials and parts to manufacturing plants, and from there moving components to assembly plants, to be partial toward maintaining low rates on finished cars from assembly points, whether they handle the finished product or not.

Proposed 75% Maximum—Shortly after the war the New York Central proposed to establish voluntarily a maximum of 75 per cent of first-class rates on automobiles, in the effort to recoup declining business in this field. A number of smaller roads joined in the proposal, but dissenting roads persuaded the ICC to suspend the published maximums. Before hearings could be arranged, increased costs compelled all roads to ask for a general rate increase, so the NYC plan was withdrawn to maintain a solid front for the general increase. Since then all plans for a reduction on automobile rates have been tabled pending a "stabilization" of the rate outlook.

It must be recognized these disparities in rates have no effect on the car buyer, who is charged the full rail freight from manufacturing point to his city. Thus, the buyer of a Chevrolet in Atlanta pays the freight from Flint, Mich., to Atlanta, regardless of the fact his car was assembled only a few miles from his door. On the face of it, this appears an unfair charge of "phantom freight" but it has been determined as the most equitable way of dealing with all buyers throughout the country and "averaging out" freight costs. If it were not done this way, the freight cost would be absorbed into the manufacturer's list price.

What Chrysler and the other complainants object to is that discriminatory rates give GM and Ford a margin of profit which can be diverted to advertising or to any of a dozen other channels—funds which the manufacturers paying the high

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,100	422,236
February	449,729*	399,471
March		519,154
April		462,323
May		359,996
June		454,401
July		489,736
August		478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos		5,549,323

* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
Mar. 5	118,267	108,343
Mar. 12	114,223	114,689
Mar. 19	120,207	115,556
Mar. 26	123,000	107,284

Ward's Automotive Reports

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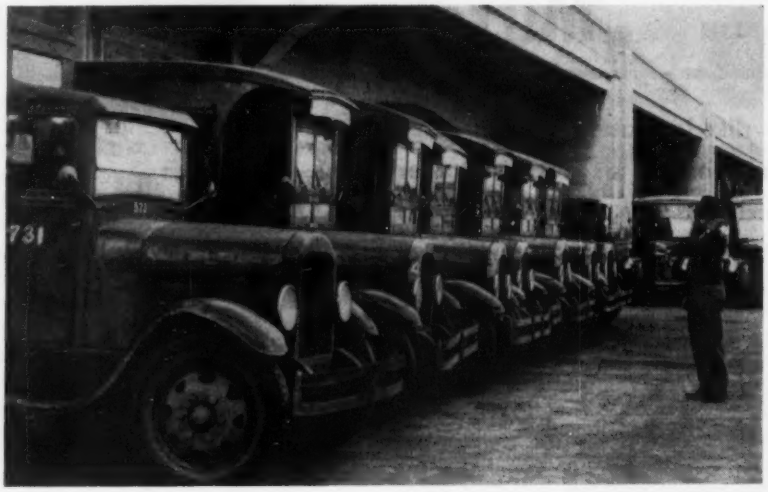


OLD BUT ACTIVE: Looking over old mail trucks of the San Francisco postoffice, a dispatcher seemingly wonders why they don't fall apart on the spot. San Francisco's average postoffice truck is 13 years old and has traveled 135,400 miles. Some of the oldest have gone 240,000 miles each. NEA photo

rates do not have available. While they would be satisfied to see rates from assembly plants lifted to the same level as those from central plant cities, they would rather see the latter charges moved down to near the former, since they are convinced they are paying excessive rates.

Lincoln To Use Hydra-Matic?

BY NOW the word has been pretty well spread throughout the press to the effect Ford is proposing the purchasing of hydra-matic transmission units from the Detroit Transmission Division of General Motors for installation on Lincoln models starting sometime this summer. No comment or confirmation has come from either of the companies involved, although obviously some negotiations are in the works. Harold Youngren, vice president-engineering at Ford, will be recalled as having played a leading role in the development of the hydra-matic while he was at Oldsmobile and before joining Borg-Warner.

Later, the Detroit Gear Division of Borg-Warner started to tool up a plant for production of a Ford automatic transmission, the project being abandoned abruptly even before Mr. Youngren went to Ford. Since then, he and his large staff presumably have been working steadily on transmission development, and Mr. Youngren himself has been driving test cars equipped with various types of drives all over the country to determine the best design. Latest word was that one of these had been approved and would make its appearance initially on Lincoln, then on Mercury and finally Ford.

However, no tooling of any consequence has been released, which could indicate the device still had some bugs in it, or that the cost of tooling a suitable plant was found to be excessive. Further, it would likely take a year or more to equip a transmission plant and it would be uneconomical to do so if the unit produced could be used only on the Lincoln.

Despite the obvious blow to Ford engineering prestige, an interim arrangement whereby General Motors would supply hydra-matics to Lincoln under some sort of licensing or royalty arrangement seems to have crystallized. GM has worked costs down appreciably on hydra-matic manufacture, having built over 400,000 of the units last year alone for its Cadillac, Oldsmobile and Pontiac Divisions. Also, it has regularly supplied various components such as bearings, fuel pumps and the like, to competing manufacturers.

Torque-Converter Gains — In the automatic transmission field, GM has really moved a few steps beyond the hydra-matic and in a matter of two or three years this unit may have become obsolete on GM models. The torque-converter type of transmission is being accepted gradually as superior to the automatic step-type gear unit like the hydra-matic. Buick has the new design in its dynaflow, to which the only serious objection has been a loss in gasoline economy (about 10 per cent) through slippage in the converter, with a consequent slight heat build-up. Chevrolet will have a torque-converter transmission available for its 1950 models, less costly to manufacture than the Buick system. Still to appear is a third type of GM transmission which combines certain features of both the dynaflow and hydra-matic. It is believed to involve a mechanism for locking out the converter unit when the car reaches cruising speed.

Steel Easier, Willys Cuts Prices

PRICE cuts in the Willys-Overland line of vehicles were not unexpected. Percentagewise they figure from 1.7 on the four-wheel drive truck, 2 on the jeep, 7.6 on the 6-cylinder station wagon, 8.6 on the 4-cylinder station wagon, 10.7 on the panel delivery truck, to 15.3 per cent on the jeepster. Resumption of production at the Toledo plant saw activity concentrated on jeeps and station wagons.

Improvement in steel supplies was a principal factor leading up to the price reductions. During the period of steel shortages since the war, Willys made no long-range contracts at high prices, nor did it move to acquire steel-producing facilities as did other companies. Some conversion tonnage was negotiated, but this has now been terminated.

Prospects of price cuts by other manufacturers are not being discounted, particularly in view of the mounting pressure on suppliers to trim their quotations. Recent Chrysler requisitions carry the pointed, and printed, suggestion that prices should be trimmed on shipments over the balance of the year. No indication is given of just how large a cut might be acceptable, although there is some guessing among suppliers that 5 per cent might be about it.

Labor Restive

INCREASING restiveness of union labor is showing up in the form of a wave of wildcat walkouts in the Detroit area. Hudson has been a frequent target, along with Briggs, Dodge, Chrysler, DeSoto, Ford and a few parts plants. Complaints over readjusted work standards incident to new model production usually are the cause of the interruptions, along with the usual desire of divergent union elements to "show their muscle" on the eve of local elections. With one eye on comfortable field stocks of cars and trucks, by comparison with previous postwar years, managements are not disposed to take drastic action to maintain a steady production pace.

THESE BOLTS ARE SOMETHING SPECIAL...

Down time is costly. Earth-moving equipment, tractors and other heavy machinery need bolts that can resist extremely severe stress, shear and impact without wear or breakage.

"National" makes special bolts for such rugged service from high carbon or alloy steel, specially heat-treated.

These bolts can really stand the gaff.

Exceptional experience and facilities in *cold heading* enable us to offer unusual service on all types of "specials" that can be made by the upset process. We are often able to effect substantial savings.

Please send us your inquiry.

THE NATIONAL SCREW & MFG. CO.
Cleveland 4, Ohio

PACIFIC COAST: NATIONAL SCREW & MFG. CO. OF CAL.
3421 S. Garfield Ave., Los Angeles 22, Cal.

National
HEADED AND THREADED
PRODUCTS

"National" Products Include
HODELL CHAINS · · · CHESTER HOISTS

Alco Diesel Sales Up

Firm completes transition to all-diesel production during 1948. Order backlog dips

SALES in 1948 of American Locomotive Co.'s diesel electric locomotives and parts increased more than 50 per cent over 1947.

The company, which last June withdrew from the production of steam locomotives, is now one of the world's largest makers of diesel electrics. Its 1948 net sales, at $143,919,000, reached a record peacetime total, were more than $33 million in excess of 1947 sales and almost twice 1941 figures. Current order backlog is $105 million, compared with $115 million a year ago.

American Locomotive's annual report points out that a revolution in railroad motive power is now in progress, as shown by the fact that locomotive orders placed by railroads in 1948 reached a 32-year high. Another high level year seems in prospect in 1949, and the company expects to build substantially more diesel electric units in 1949 than in 1948. The replacement parts field, more important for a maker of diesel electrics than for a manufacturer of steam units, is likely to have increasing significance in the next few years.

The company's capital expenditures for last year amounted to $2,360,000, chiefly to expand facilities at Schenectady, N. Y. Plant improvement budget for 1949 calls for about $2,991,000, to be spent largely to expand the Railway Steel Spring and Alco Products Divisions.

Net profit for last year totaled $5,491,000, compared with $4,421,000 in 1947. The 1948 showing was hampered by the transition to all-diesel production.

Baldwin Backlog Off Slightly

BALDWIN Locomotive Works, Eddystone, Pa., had unfilled orders on a consolidated basis at the end of 1948 of $109,268,072, compared with $118,528,000 at the beginning of the year.

C. E. Brinley, chairman, stated in the annual report that advances were made in development and construction of diesel electric locomotives—the most important single item in Baldwin's manufacturing program—and costs have been reduced.

Unfilled orders for both diesel electric and steam locomotives provided a substantial backlog for 1949, Mr. Brinley said.

During the year Baldwin had net earnings of $3,167,741 on sales of $126,434,845, compared with a net of $1,693,624 on sales of $94,884,746 in 1947.

PROGRAM PLANNERS: A public relations program for the electroplating industry is studied by this special advisory committee of the American Electroplaters' Society. Left to right are: C. F. Nixon, director of process engineering, Fisher Body-Ternstedt Division, General Motors Corp., Detroit; L. M. Hague, president, Hanson-Van Winkle-Munning Co., Matawan, N. J.; D. X. Clarin, district manager, Oakite Products Inc., New York; W. M. Phillips, chairman of the committee and head of electrochemistry department, General Motors Research Laboratories, Detroit; R. M. Shock, executive secretary, National Association of Metal Finishers, Detroit; and A. R. Putnam, AES national office, Jenkintown, Pa.

Avildsen Buys Clark's Celfor Unit

AVILDSEN Tools & Machines Inc., Chicago and New York, manufacturer of machinery for making drills and other cutting tools, has acquired Celfor Tool Division of Clark Equipment Co. Celfor, producer of drills and other cutting tools, will move from Buchanan, Mich., to 815 W. Jackson Blvd., Chicago.

Avildsen is the new name for a firm organized in 1940 as Republic Drill & Tool Co. The original Chicago plant will continue to be known as Republic Drill & Tool Co. and will be operated as a separate division. Avildsen's New York plant will be known as Century Drill & Tool Division.

National Steel Boosts Expansion

NATIONAL Steel Co. spent more than $27 million in 1948 on property additions and has started this year with a $40 million construction program.

Current projects include construction of an open-hearth furnace at the subsidiary Great Lakes Steel Corp. and rebuilding a furnace at Weirton Steel Co., another subsidiary. A 400-ton per day oxygen plant will be completed in June and new electrolytic facilities in July.

National Steel's total sales in 1948 were $436,522,051, compared with sales of $328,957,189 in 1947. This greatly increased volume was due in part to the fact that the corporation converted into finished products a substantial quantity of semifinished steel from outside sources during 1948.

Net earnings in 1948 amounted to $40,121,506, compared with $26,838,788 in 1947.

Commercial Shale Oil Output Seen

AMERICA'S reserves of oil may be multiplied many times over by a significant development now being successfully tested in Colorado. A pilot plant at Rifle, Colo., operated by the Bureau of Mines, is mining shale rock and transforming its near-solid petroleum content into crude oil.

Using processes developed by Union Oil Co., the plant currently is mining and processing shale rock at a rate of 500 tons per day.

Potential importance of the new process to the nation and to industry is revealed in the estimate of engineers that 300 billion barrels of shale oil are "in sight" in the Rocky Mountains. This compares with 35 billion barrels of oil produced by the entire American petroleum industry since its inception.

Giant caverns, which would dwarf the Carlsbad Caverns, are being produced by the shale mining operation and would be ideal to house underground industries, Bureau of Mines representatives point out.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Janette Mfg. Co., Chicago, designer and maker of gear motors, speed reducers and rotary converters, has appointed Henry W. Miller Electric Co., Omaha, Nebr., as a representative in Nebraska and western Iowa and George E. Zweifel & Co., Portland, Oreg., as an agent in Oregon, Washington and Idaho.

—o—

New York Shipbuilding Corp. will begin construction Apr. 4 on the first of three $11 million liners for American President Lines at its Camden, N. J., yards.

—o—

United States Rubber Co. has moved its Chicago branch office from 440 W. Washington St. to larger quarters in the Merchandise Mart Bldg.

—o—

Allied Structural Steel Co., Chicago, has purchased for $475,000 the east portion of Plancor 1789, Hammond, Ind., formerly used as War Assets Administration's disposal center No. 6. The property, purchased from WAA, includes nearly 28 acres of land and one large building which will be used in the fabricating of structural steel.

—o—

Bureau of Mines will dedicate two new coal-to-oil demonstration plants on May 8 at Louisiana, Mo. The units have been erected at a combined cost of $15 million to serve as a proving ground for American coals, equipment and processing methods.

—o—

Union Pacific Railroad, Omaha, Nebr., reports that freight loss and damage claims decreased 14 per cent in 1948 compared with 1947. The railroad has been conducting a freight loss and damage prevention program.

—o—

American Brake Shoe Co., New York, is expanding its sales activities in Cleveland with the addition of the National Bearing Division in its sales offices at 915 Midland Bldg. L. E. Hoyer and J. Robert Lottes, National Bearing representatives, join agents of the company's other divisions in the enlarged office which is under the general direction of James J. Nelson.

—o—

Fairchild Engine & Airplane Corp., New York, will discontinue its personal plane operation at Strother Field, Kans. Sale of spare parts for Fairchild's light planes already in customers' hands and for primary trainers will continue to be handled from Strother Field.

—o—

Glauber Brass Mfg. Co., Kinsman, O., has been purchased by Harlow B. Salter, and its name has been changed to Glauber Brass Inc. Company will make plumbing fixtures, and water works and laboratory equipment. Glauber was formerly one of the affiliates of H. B. Salter Mfg. Co., all of which were sold to Eljer Co. last August.

—o—

Thomas C. Wilson Inc., Long Island City, N. Y., manufacturer of tube cleaning equipment, has purchased the tube expander business of Richard Dudgeon Inc., New York.

—o—

Studebaker Corp., South Bend, Ind., has completed a new assembly plant at Vernon, Calif.

—o—

Vacuum Cleaner Manufacturers' Association, Cleveland, reports that factory sales of standard-size household vacuum cleaners in February totaled 241,267, an increase of 5.5 per cent over January sales and a decrease of 22.5 per cent from figures for February, 1948.

—o—

Westinghouse Electric Supply Co., wholly owned by Westinghouse Electric Corp., has opened a new appliance and radio branch in Vernon, Calif.

—o—

Wacker Sales Co., Chicago, has been named Midwestern sales representative for Imicro internal micrometers manufactured by Tesa Corp. of Switzerland.

—o—

Hydropress Inc., New York, designer and builder of heavy hydraulic equipment, has received an order from Page-Hersey Tubes Ltd., Welland, Ontario, for a large tube testing and expanding machine.

—o—

Snyder Tool & Engineering Co., Detroit, manufacturer of special-purpose machines for the automotive and similar industries, has named the newly formed McCoy-Melling Co. as its sales representative in Michigan, except for the Detroit metropolitan area.

—o—

American Material Handling Society is filing papers of incorporation in Delaware. The society already has nine chapters, and two others are being organized in Louisville and Fort Wayne, Ind.

—o—

Morris P. Kirk & Son Inc., a subsidiary of National Lead Co., New York, formally dedicated its new Portland, Oreg., nonferrous smelter and refinery Mar. 19.

—o—

Cooper Alloy Foundry Co., Hillside, N. J., producer of alloy castings, is offering a training film entitled "Molding on a Jolt Roll-Over Pattern Draw Machine," to any engineering school, society or club interested in foundry practice. The 16 mm film runs 22 minutes.

—o—

National Sheet Metal Corp., manufacturer of heating and air conditioning equipment, has purchased a one-story plant at 272-80 Siegel St., Brooklyn, N. Y.

—o—

E. I. du Pont de Nemours & Co., Wilmington, Del., reports new production records were made in output of many of its products in 1948, including nylon, cellophane, acetate rayon, pigment colors, methanol, antifreezes and hydrogenated items.

—o—

Claud S. Gordon Co., Chicago, maker of industrial instruments and metallurgical equipment, has opened a branch plant at 2035 Hamilton Ave., Cleveland. Manufacturing operations and sales offices will be located in the new quarters.

—o—

Aircooled Motors Inc., Syracuse, N. Y., wholly owned subsidiary of Tucker Corp., Chicago, will be maintained in full operation, according to a statement by trustees for the parent firm.

—o—

Ryan Aeronautical Co., San Diego, Calif., has bolstered its backlog by orders for more than $750,000 of stainless steel metal products.

—o—

Precision Welder & Machine Co., Cincinnati, manufacturer of resistance welding equipment, has appointed Myron Zucker Engineering Co., Detroit, as its representative in southeast Michigan and Toledo, O.

—o—

War Assets Administration is offering for sale or lease a forge works at 3695 E. 78th St., Cleveland, now leased to Champion Machine & Forging Co. on an interim basis. Sealed bids on the property will be accepted by WAA until Apr. 15 at 704 Race St., Cincinnati.

—o—

Ranger Engines Division, Fairchild Engine & Airplane Corp., Farmingdale, N. Y., will manufacture major component parts for General Electric Co.'s J-47 turbojet engine.

The Business Trend

INDUSTRIAL activity declined from the preceding week as STEEL's industrial production index dropped to 169 per cent (preliminary) of the 1936-1939 average in the week ended Mar. 19. Gains registered in the steel rate and in automobile and truck assemblies were offset by a decrease in freight carloadings due to the walkout in the coal mining industry.

STEEL—Production of steel for ingots and castings set all-time high in the week ended Mar. 19, reaching 101.5 per cent of capacity. Translated into tonnage figures this means that the nation's steelmakers produced around 1,871,169 net tons. One steelmaker has announced curtailment of operations due to a shortage of coal caused by the miners' walkout.

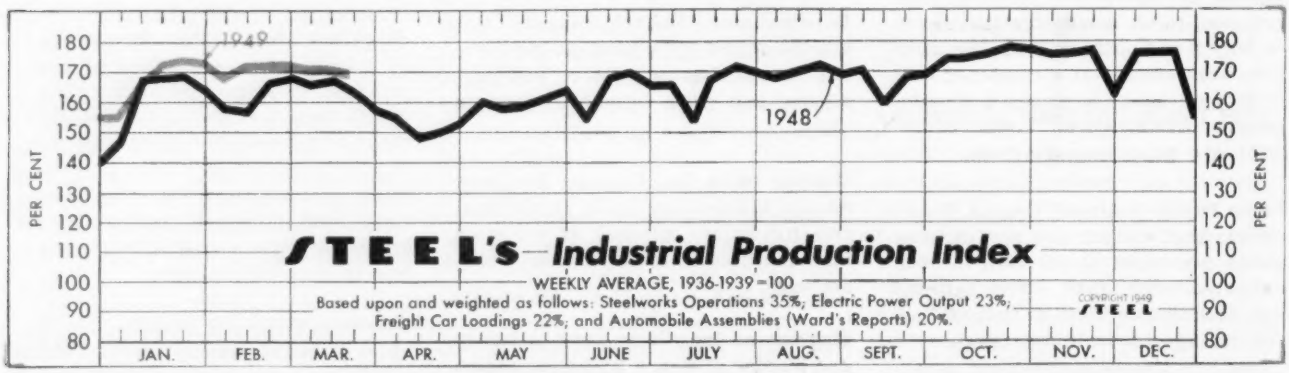
AUTOMOBILES—Outturn of passenger cars and trucks reached a high mark for this year in the week ended Mar. 12 as 120,207 units rolled off the assembly lines. Schedules call for even greater production in subsequent weeks but the problem of body shortages must be licked by a major producer before any significant gains are effected. On the gloomy side of the automotive picture, is the fact that dealer stocks of trucks are piling up at a rapid rate in all weight classifications except "light."

TRUCKLOADINGS—Volume of freight transported by motor carriers in January dropped 5.4 per cent below December but increased 2.9 per cent over January, 1948, according to American Trucking Associations Inc. Tonnagewise the carriers hauled an aggregate of 2,726,974 tons in January. Carriers of iron and steel hauled about 3 per cent of the total, a decrease of 1.2 per cent from the December figure but an increase of 28.9 per cent over January, 1948.

RAILROADS—Association of American Railroads announces that all railroads and private carlines had 85,974 freight cars on order on Mar. 1. Of this total Class 1 railroads had 78,061 new freight cars on order, of which number 31,408 will be built in railroad shops and 46,653 in outside shops. Class 1 railroads also had 1495 locomotives on order as of Mar. 1, including 43 steam and 1452 diesel locomotives.

POWER—Although the amount of electrical energy distributed in recent weeks has been below the all-time peak established in the week ended Jan. 29, weekly totals this year have been consistently higher than for corresponding weeks of 1948 and more than double the prewar figures. An estimated additional 5.4 million kw of generating capacity are scheduled to be installed this year, topping last year's record total by 59 per cent.

PRICES—The wholesale price index of the Bureau of Labor Statistics declined 0.3 per cent in the week ended Mar. 15 to 158.5 per cent of the 1926 average. This level is the same as four weeks ago and 3.2 points lower than in the corresponding week of 1948. The index for metals and metal products continued its downward movement to 177.6 per cent of the 1926 average, one-half a point below the level of four weeks ago but 21.8 points higher than in the corresponding week of 1948.



Index (chart above): Week ended Mar. 19 (preliminary) 169 Previous Week 170 Month Ago 171 Year Ago 164

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	101.5	100.5	100.0	96.0
Electric Power Distributed (million kilowatt hours)	5,496	5,531	5,650	5,145
Bituminous Coal Production (daily av.—1000 tons)	1,724	1,722	1,907	2,242
Petroleum Production (daily av.—1000 bbl)	5,145	5,123	5,361	5,240
Construction Volume (ENR—Unit $1,000,000)	$127.3	$184.6	$146.6	$90.3
Automobile and Truck Output (Ward's—number units)	120,207	114,223	114,207	115,556

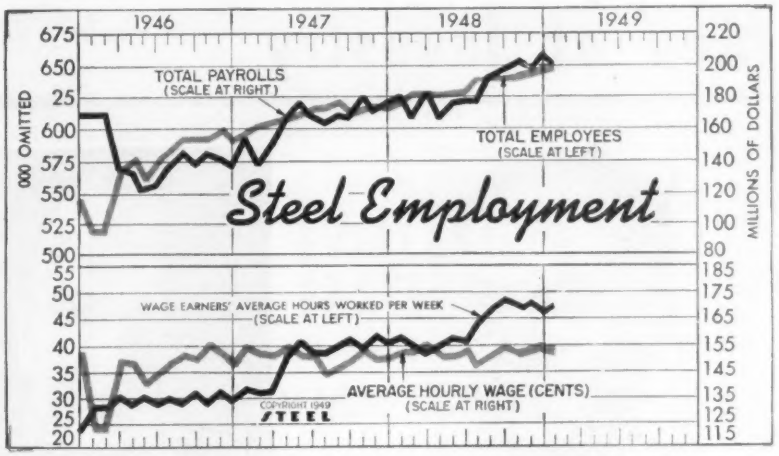
* Dates on request. † 1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.

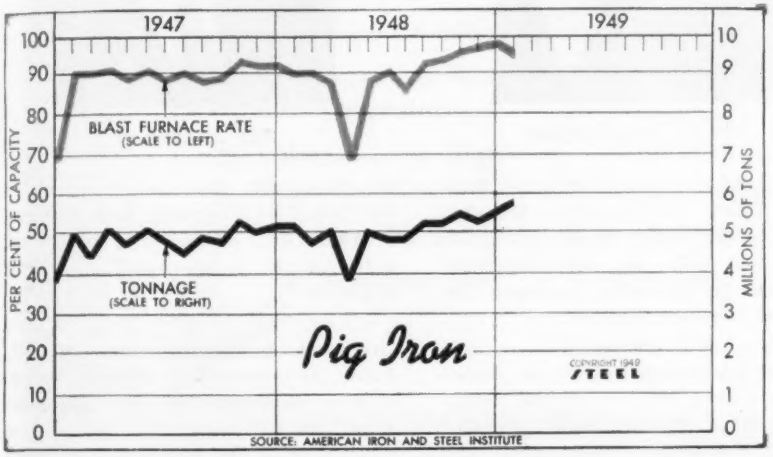
TRADE				
Freight Carloadings (unit—1000 cars)	608†	709	697	700
Business Failures (Dun & Bradstreet, number)	210	179	180	106
Money in Circulation (in millions of dollars)‡	$27,500	$27,577	$27,480	$28,006
Department Store Sales (changes from like wk. a yr. ago)‡	−8%	−8%	none	+4%

† Preliminary. ‡ Federal Reserve Board.

Steel Employment

	Employees† (000)		Total Payrolls (millions)		Hourly Wages† (cents)	
	1949	1948	1949	1948	1949	1948
Jan.	650	622	$202.1	$180.2	171.3	157.3
Feb.	...	626	....	167.6	....	155.1
Mar.	...	629	....	183.0	....	154.8
April	...	626	....	168.5	....	155.1
May	...	628	....	175.3	....	157.7
June	...	634	....	179.5	....	156.9
July	...	641	....	179.8	....	164.5
Aug.	...	645	....	193.8	....	168.9
Sept.	...	641	....	199.4	....	171.8
Oct.	...	644	....	201.7	....	169.9
Nov.	...	646	....	199.8	....	172.1
Dec.	...	648	....	205.8	....	169.4





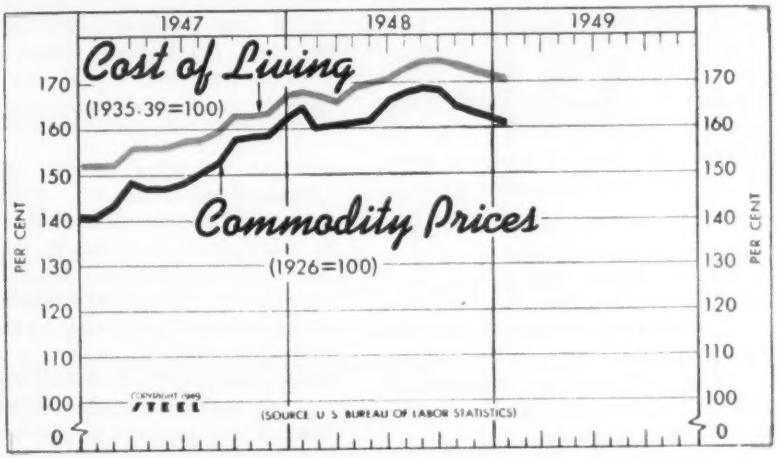
Pig Iron*

	Production (Net Tons—000)			Operating Rate (% of Capacity)		
	1949	1948	1947	1949	1948	1947
Jan.	5,725	5,194	5,071	95.5	90.9	90.8
Feb.	....	4,838	4,550	...	90.6	90.3
Mar.	....	5,020	5,123	...	87.8	91.8
Apr.	....	3,840	4,830	...	69.4	89.3
May	....	5,077	5,081	...	88.8	91.0
June	....	4,990	4,810	...	90.2	89.0
July	....	4,900	4,585	...	85.9	90.3
Aug.	....	5,255	4,916	...	92.0	88.1
Sept.	....	5,208	4,801	...	94.3	89.0
Oct.	....	5,520	5,228	...	96.6	93.6
Nov.	....	5,399	5,015	...	97.6	92.8
Dec.	....	5,595	5,177	...	98.1	92.9
Total	....	60,849	59,210	Ave. ...	90.2	90.1

* Includes ferromanganese and spiegeleisen.

Wholesale Commodity Price—Cost of Living Indexes

	—Commodities— (1926=100)			—Living Cost— (1935-39=100)		
	1949	1948	1947	1949	1948	1947
Jan.	160.6	165.7	141.5	170.9	168.8	153.3
Feb.	....	160.8	144.5	....	167.5	153.2
Mar.	....	161.4	149.5	....	166.9	156.3
Apr.	....	162.7	147.7	....	169.3	156.2
May	....	163.9	147.1	....	170.5	156.0
June	....	166.2	148.0	....	171.7	157.1
July	....	168.7	150.8	....	173.7	158.4
Aug.	....	169.5	153.7	....	174.5	160.3
Sept.	....	168.7	157.4	....	174.5	163.8
Oct.	....	165.2	158.5	....	173.6	163.8
Nov.	....	164.0	159.6	....	172.2	164.9
Dec.	....	162.3	163.2	....	171.4	167.0
Ave.	....	164.9	151.8	....	171.2	159.2



FINANCE	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,880	$12,233	$12,711	$15,302
Federal Gross Debt (billions)	$252.0	$252.0	$252.6	$253.5
Bond Volume, NYSE (millions)	$14.5	$14.8	$14.4	$17.5
Stocks Sales, NYSE (thousands)	3,894	4,515	3,908	5,875
Loans and Investments (billions)†	$62.0	$62.0	$62.2	$64.1
United States Gov't. Obligations Held (millions)†	$33,206	$33,069	$33,016	$36,193

† Member banks, Federal Reserve System.

PRICES				
STEEL's Composite Finished Steel Price Average	$97.77	$97.77	$97.77	$81.14
STEEL's Nonferrous Metal Composite‡	223.5	227.9	232.6	189.5
All Commodities†	158.5	159.0	158.5	161.7
Metals and Metal Products†	177.6	177.8	178.1	155.8

† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100.

Men of Industry

HAROLD S. DUNN

VINCENT VANDERVOORT

FRED ZIMMERMAN

Harold S. Dunn, Pittsburgh district sales manager, Harbison-Walker Refractories Co., Pittsburgh, has been appointed general sales manager. **Richard S. Moore** has been appointed manager of basic sales.

—o—

Richard A. Heald, treasurer, Heald Machine Co., Worcester, Mass., has been elected president, succeeding his brother, **Roger N. Heald,** who became chairman of the board of directors. Roger Heald has been president since 1931.

—o—

Norman F. Tisdale, chief metallurgical engineer since 1933 for Molybdenum Corp. of America, Pittsburgh, has been appointed manager of sales.

—o—

Arthur C. Heller was elected president of Heller Bros. Co., Newark, N. J., succeeding the late **Paul Heller. James G. Henry Jr.** was elected vice president and secretary, **Lawrence B. Heller,** assistant secretary, and **Anna W. Ibach,** treasurer.

—o—

W. D. Wilkinson, Chicago, has been appointed Midwest representative for Monarch Aluminum Mfg. Co., Cleveland. Formerly associated with Gerity-Michigan Co., Adrian, Mich., and previously with Michigan Light Alloys Division, Chicago Railway Equipment Co., he will handle the entire Illinois territory, and will also represent Monarch in St. Louis, and part of Indiana. **B. J. Weidman** since November has represented Monarch in the Michigan territory. He had previous association with Central Pattern & Foundry Co., Chicago, and more recently operated in the Michigan area as a sales agent, representing a number of manufacturers. **Walter V. Tracy,** who joined the Monarch home office sales organization in November, 1947, has been appointed assistant to the sales manager, Industrial Castings Division.

—o—

Vincent Vandervoort has been elected vice president, Marlow Pumps, Ridgewood, N. J. He has been affiliated with the company since 1947, and was previously associated for 20 years with Watson Machine Co., Paterson, N. J., from which he retired as president a year and a half ago.

—o—

Sterling Grinding Wheel Division, Cleveland Quarries Co., Tiffin, O., announces appointment of three men to managerial positions in the Sterling sales organization: **Ralph H. Lott** will assume the administrative duties of co-ordinator of sales. **Arthur J. Schneider** has been appointed general sales manager, with managerial control of the sales staff. **William F. Schlick** was assigned as district manager of the Chicago branch, succeeding Mr. Lott.

—o—

Robert W. Desing was named assistant director of industrial relations, with company-wide responsibilities, for Budd Co., Philadelphia. **Harper Adams** was appointed personnel manager at the Hunting Park plant, and **Elwood Stirling** was named assistant personnel manager, same plant.

—o—

Charles E. Wilbur, formerly assistant secretary and treasurer, C. M. Kemp Mfg. Co., Baltimore, has been elected secretary and treasurer, and **Wilfred G. Keir** was added to the board of directors. **J. Clarence Kimpel,** elected president, will also be chairman of the board of directors, and **Edward J. Funk Jr.,** elected vice president, will continue in his capacity as chief engineer.

—o—

Broderick & Bascom Rope Co., St. Louis, announces two changes in executive responsibility. **Fred Zimmerman,** vice president, who has been in charge of sales, assumes the position of director of sales. **J. J. Sieber** has been appointed sales manager. He most recently held the position of chief product engineer, operating from the home office.

—o—

Judson G. Hyde has been appointed comptroller of Sperry Products Inc., Danbury, Conn. He formerly was resident manager of the Stamford office of Hadfield, Rothwell, Soule & Coates of Hartford and Stamford.

—o—

George S. Berry has been appointed district sales manager for the Philadelphia district sales of Pittsburgh Steel Co., Pittsburgh. He became associated with the company in 1943 and has held positions in the Pittsburgh and Philadelphia district sales offices.

—o—

Robert E. O'Brien has been named district representative in the Cleveland territory by Heppenstall Co., Pittsburgh. **Jack R. Allen,** formerly of the Cleveland district, has established a manufacturers' representative office in the Swetland Bldg., Cleveland, after a 15 year association with Heppenstall Co.

—o—

Ralph H. Gage, president, Gage Structural Steel Corp., Chicago, has been appointed to direct industry

—An amazing combination of advantages in favor of non-ferrous and stainless steel bolt and nut products—advantages which make your product stand up and perform better under adverse conditions—advantages in greater service, disassembly or adjustment—and all at a cost only slightly more than common steel.

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Branch Offices—Atlanta, Cambridge, Cincinnati, Cleveland, Dallas, Denver, Detroit, Grand Rapids, Los Angeles, Milwaukee, Philadelphia, St. Louis, San Francisco, Seattle, Toronto (Canada)

solicitation activities for the American Cancer Society's $750,000 Chicago area fund drive.

—o—

Recent appointments in the sales organization of Binks Mfg. Co., Chicago, are: **H. J. Fink,** to direct sales and service in Colorado, Kansas, Nebraska, Wyoming, Montana and New Mexico, with headquarters at Longmont, Colo.; **C. J. Rood,** manager of the Indianapolis branch office; **M. B. Scully,** to handle sales and service in northern Illinois and in Iowa, with headquarters at Princeton, Ill.; **E. J. Cremer,** to handle sales and service in southern Illinois and in Missouri, with headquarters at St. Louis; and **B. R. Fulton,** in charge of the company's new and enlarged direct factory sales and service branch in Cleveland. **J. J. Lynch,** for many years a sales engineer with Binks Mfg. Co., has organized the Bay State Spray Equipment Co., in Springfield, Mass., and Boston and will handle sales in that area. **Harvey J. Dueno** has been appointed manager of Binks' direct factory sales and service branch in Milwaukee.

—o—

Herman C. Strom, vice president, Pittsburgh Steamship Co., Cleveland, subsidiary, United States Steel Corp., will retire Mar. 31. He joined the company in 1907, and was named vice president in 1941.

—o—

Robert H. Askren has been appointed business director, Robert Sidney Dickens & Associates, Chicago designer.

—o—

A. R. Meyer has been appointed assistant sales manager, National Supply Export Corp., subsidiary, National Supply Co., Pittsburgh. He will have headquarters in New York.

—o—

Harold A. Muttach, formerly blast furnace superintendent, has been appointed general superintendent of the Missouri-Illinois plant of Koppers Co. Inc., at Granite City, Ill. **John E. Brown** succeeds to blast furnace superintendent and **James E. Oesterle** becomes coke plant superintendent in their respective departments. Other promotions at the plant are: **George W. England Jr.,** assistant blast furnace superintendent; **John J. Pistrui,** assistant coke plant superintendent; **William E. Turner,** general by-products foreman; and **Robert F. Stone,** by-products shift foreman.

—o—

H. P. Erbe, office manager of the Cleveland district sales office, Carborundum Co., Buffalo, has been appointed office manager of the Pittsburgh district sales office to succeed **F. H. Appenrodt,** resigned. Mr. Erbe will assume his new duties Apr. 1. **R. L. Heimstadt,** assistant office manager, Detroit district sales office, has been promoted to office manager of the Cleveland district sales office. **D. S. Masson,** manager, sales administration, home office, has been promoted to assistant to the district sales manager in Detroit. Mr. Masson will be responsible for overall operation of the Detroit district sales office under **J. F. Claydon,** district sales manager. **J. R. Middleton** will continue as office manager at Detroit.

—o—

Alan T. Wolcott has been appointed manager of advertising and sales promotion, and **John A. Grove** as manager of marketing research for the chemical department, General Electric Co., at Pittsfield, Mass.

—o—

Furnace Engineers Inc., Pittsburgh, announces that **W. G. McClain** has been given a six month's leave of absence at the request of the United States government, who is using him as a visiting expert overseas.

—o—

Edward L. Fortin and **James Kniveton** have been elected vice presidents of Selas Corp. of America, Philadelphia. Mr. Fortin will continue as treasurer, in addition to his new office, and Mr. Kniveton, an engineer, will assume greater responsibilities for the development of special-purpose gas processing equipment, in cooperation with industry development engineers.

—o—

A. W. Gregg, consulting engineer, Whiting Corp., Harvey, Ill., **Fred B. Skeates,** foundry superintendent, Link-Belt Co., Chicago, and **Chester V. Nass,** vice president, Pettibone Mulliken Corp., Chicago, were appointed by the Chicago Chapter, American Foundrymen's Society, to function as an advisory committee to the foundry practice and pattern design course of the Chicago Undergraduate Division, University of Illinois, Navy Pier, Chicago. Mr. Gregg is chairman of the group.

—o—

Robert L. Zahour has rejoined the Bloomfield, N. J., Lamp Division of Westinghouse Electric Corp., and will handle special lamp applications.

—o—

M. W. Sledge has been appointed assistant manager of the belting sales department, Goodyear Tire & Rubber Co., Akron, succeeding the late **W. P. Hallstein.**

—o—

J. J. Allman has been named manager of accessories sales, Associated Lines Sales Division, B. F. Goodrich Co., Akron.

—o—

Brooks Rotameter Co., Lansdale, Pa., announces appointment of **John G. Kirkpatrick** as its exclusive representative in the Pittsburgh area. He has been instrument engineer for Koppers Co. for the past seven years.

—o—

F. H. Jones has been appointed general credit manager, Kaiser Co. Inc., Fontana, Calif.

—o—

Ray Sellens has been appointed sales manager of residential products, Building Products Division, Reynolds Metals Co., Louisville. He has been special representative in the company's Eastern Division.

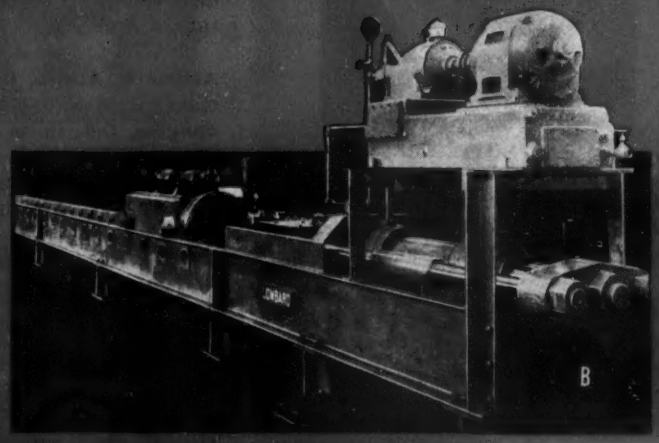
—o—

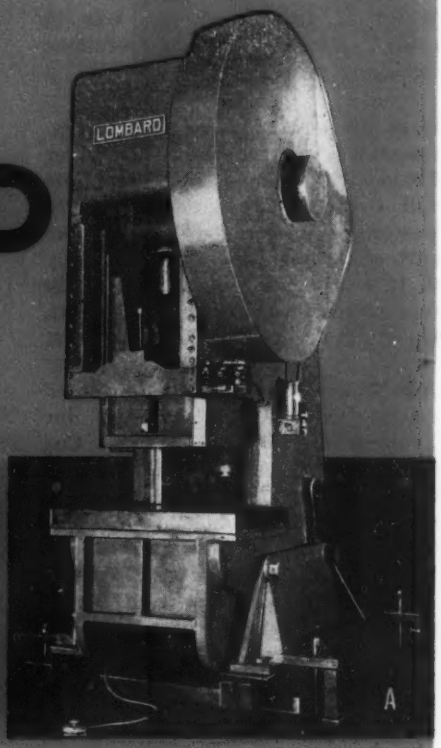
Augustus H. Elliott, vice president of Southern Wheel Division, American Brake Shoe Co., New York, has retired after 40 years of service with the company. He served for nearly 18 years with Brake Shoe in various sales and engineering capacities in Philadelphia and New York. He be-

JAMES KNIVETON

EDWARD L. FORTIN

LOMBARD





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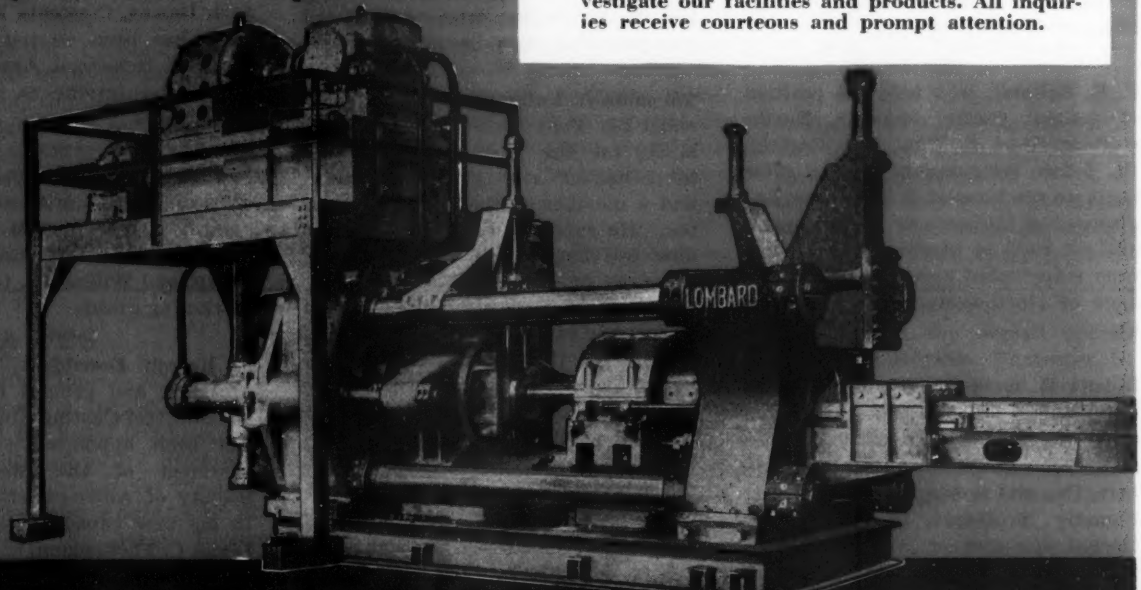

LOMBARD CORPORATION

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came a vice president of Southern Wheel in 1927, where he was in charge of engineering and operations for many years.

—o—

D. M. Cooper has been appointed representative to the steel industry for National Gypsum Co., Buffalo. He will cover nine counties of northwestern Pennsylvania, taking over part of the territory now covered by **R. R. Rychener.** Mr. Cooper recently represented the Detrex Corp., Detroit. He will make his home in Butler, Pa.

—o—

John Mulholand has been appointed traffic manager at Chicago for Youngstown Sheet & Tube Co., Youngstown, effective Apr. 1. It was erroneously reported in the Mar. 21 issue that Mr. Mulholand would be traffic manager at Youngstown. **W. E. Fowler** holds the latter position with the company, and is in charge of both the Youngstown and Chicago traffic departments.

—o—

A certificate of Merit from President Truman was recently presented to **William C. Heath,** president, A. O. Smith Corp., Milwaukee, awarded for work done by A. O. Smith Corp. during the war in the development and production of welded hollow steel propeller blades.

—o—

Metal Industries Department, Diversey Corp., Chicago, has added five men to its staff of field service engineers. They are **A. J. Crouch, P. M. Saxman, W. H. Murphy, E. F. Manning,** and **E. V. Hall.**

—o—

T. R. Bellmar, who held the position of general traffic manager, Northwestern Steel & Wire Co., Sterling, Ill., before resigning in 1946 to enter business for himself in Arkansas, has disposed of his business interests, and has returned to Sterling, Ill. He has been reappointed general traffic manager of Northwestern Steel & Wire Co.

—o—

Robert M. Gordon, president, Gordon Lubricating Co., McKees Rocks, Pa., and **John R. Ponsetto,** head of Ponsetto Sales & Service, East McKeesport, Pa., and president of Penn Scott Foundry, Scottdale, Pa., have been elected directors of American Cladmetals Co., Carnegie, Pa., following enlargement of the board's membership from five to seven.

—o—

Appointment of four staff members, including three industrial designers, as associates in the product design firm of J. O. Reinecke, Chicago, are: Designers, **John W. Hauser, G. Harold Hart,** and **Joseph A. Hill. Jack B. Knight,** business director, was also appointed an associate.

STANLEY S. WILLIS

—o—

Stanley S. Willis has been appointed Chicago district manager of the Brass Division, Kerotest Mfg. Co., Pittsburgh. Connected with the company since 1931, he has been production planning manager over all operations for the past 10 years. **Kenneth F. Vilsack** was named steel valve representative for the same territory now covered by Mr. Willis, which comprises Indiana, Illinois, Wisconsin, Minnesota, North and South Dakota and Montana.

—o—

A. H. Anderson has been appointed general superintendent, General Fireproofing Co., Youngstown, succeeding **Leo B. McCarthy,** who was elected vice president in charge of operations.

—o—

Theodore O. Yntema, consulting economist for Ford Motor Co., Dearborn, Mich., for the past two years, has been named vice president-finance, and a member of the policy committee. He succeeds **L. D. Crusoe,** who now is vice president and general manager of the newly formed Ford Division of the company. Mr. Yntema is leaving his positions as research director of the Committee for Economic Development; consulting economist to Lord-Abbett & Co., New York; consulting economist to Stein, Roe & Farnham, Chicago; and professor of business and economic policy in the school of business, University of Chicago.

—o—

Oregon Chapter, Institute of Scrap Iron & Steel Inc., has elected the following officers: **Jack Rosenfeld,** Zidell Machinery & Supply Co., Portland, elected president, succeeding **Maurice J. Rosenfeld** of the California Bag & Metal Co., Portland, named chairman of the board. Other officers elected include vice president, **Monte Wolf,** Alaska Junk Co., Portland; treasurer, **Jack Barde,** Barde Steel Co., Portland; and secretary, **A. Victor Rosenfeld,** California Bag & Metal Co.

—o—

J. Robert Walker Jr., controller of Kaiser Co. Inc., Oakland, Calif., and **M. S. Sutherland,** controller of Burlington Steel Co. Ltd., Hamilton, Ontario, Canada, have been elected to membership in the Controllers Institute of America.

—o—

Arthur B. Austin, formerly assistant manager, Hercules Powder Co., Wilmington, Del., in its explosives office, Chicago, has been named manager of the Joplin, Mo., office, succeeding the late **M. W. Latimer.**

—o—

Levi W. Reeves, assistant manager of the wire department, Sheet & Wire Division, Tennessee Coal, Iron & Railroad Co., Birmingham, has been appointed assistant manager of sales, Memphis, Tenn., district sales office.

—o—

Detroit Steel Products Co., Detroit, announces election of **H. F. Wardwell,** former president of the company, to chairman of the board; **W. C. Owen,** former executive vice president, as president; and **William Gillett** and **E. C. Hodges** as vice presidents.

—o—

Frank S. Best has been appointed quality control engineer, Cordley & Hayes, New York.

—o—

Jack Downs, Clements Mfg. Co., Chicago, has been elected president of Clearing Industrial Association, Chicago, after serving as a director for seven years.

—o—

McKinsey & Co., management consultant, New York, announces appointment of **Simon H. Wareham** to the New York office's manufacturing group, and **William C. Graham** to the marketing group.

—o—

F. Kermit Donaldson, recently vice president and general manager, Machined Steel Casting Co., Alliance, O., has been appointed executive vice president of the Steel Founders' Society of America, effective Apr. 1. In his new capacity he will succeed **Leslie C. Thellemann.**

—o—

Vincent dePaul Goubeau has been elected vice president in charge of the materials department, RCA Victor Division, Radio Corp. of America, Camden, N. J. He joined the division in 1945 as director of materials.

—o—

John C. Oliver has joined the staff of

JAY J. MARTIN

Elected vice president of operations, Colorado Fuel & Iron Corp., Denver. Noted in STEEL, Mar. 7 issue, p. 98

VERNON H. OLSON

Appointed general sales manager, W. O. Barnes Co. Inc., Detroit. Noted in STEEL, Mar. 21 issue, p. 94

HOWARD M. GIVENS JR.

General manager, tool and high speed steel sales, Crucible Steel Co. of America, New York. Noted in STEEL, Mar. 14 issue, p. 81

Porcelain Enamel Institute, Pittsburgh, as assistant to managing director.

—o—

Roger W. Hofheins has been appointed assistant to the vice president-sales, in charge of product development of the Rigidized Metals Corp., Buffalo. In 1940 Mr. Hofheins organized the Amphibian Car Corp., Buffalo, and developed the first successful military amphibious vehicles. During World War II he was engaged in amphibious operations for both the Army and Navy. He has since been active in automotive sales and engineering, and air conditioning and air purification.

—o—

Acme Steel Co., Chicago, announces appointment of **W. S. Huss** as sales manager of the Southern Division, with headquarters in Atlanta. He has been associated with the company for the past 30 years. Assisting Mr. Huss will be **J. C. Brill,** New Orleans district manager, and **C. A. Carrell** and **W. G. Polley,** special representatives. Mr. Huss succeeds **F. H. Webb,** retired.

—o—

Cleveland Pneumatic Tool Co., Cleveland, announces the following elections: **Vern R. Drum,** vice president, **John F. Wallace,** vice president, **E. W. Cleveland,** vice president, **Ogden Ashley,** treasurer, **Lloyd R. Shivley,** controller, and **Melvin J. Balser,** assistant controller. **Ray E. Greenough** was appointed chief engineer.

—o—

John W. Carpenter, Dallas, leader in the forming of the Lone Star Steel Co. and operation of its blast furnace at Lone Star, Tex., has resigned as chairman of the board of directors. He will devote a greater portion of his time to a multi-million construction program scheduled during the next few years by the Texas Power & Light Co., of which he is president. He resigned as president, Lone Star Steel Co., in 1947 to become board chairman.

—o—

H. S. Newhall, manager, Electrothermic Division, Pittsburgh Lectromelt Furnace Corp., Pittsburgh, will leave Apr. 25 for a two months' visit to Norway, Sweden and England. He will supervise the initial operation of an electric furnace installation at the Porsgrunn Elektrometallurgiske A/S plant in Porsgrunn, Norway, and consult with European engineers on the latest developments in electric furnace ore reduction.

—o—

John A. Jones, editorial director, Weirton Steel Co., Weirton, W. Va., has been elected vice president of American Association of Industrial Editors. He will be in charge of public relations for the national group in 1949-50. **Arch Hancock,** Remington Rand Inc., New York, was elected president.

—o—

James F. Brehm has been elected vice president, Frederick Hart & Co. Inc., Poughkeepsie, N. Y., a member of ATF Inc. group of companies. Mr. Brehm has been executive vice president of Bay State Optical Co.

OBITUARIES . . .

Walter Rufus Howell, 60, president, Bliss & Laughlin Inc., died suddenly Mar. 15 at his home in Chicago. Mr. Howell had been active head of the Harvey, Ill., company for the last 29 years. He was also a director of Buda Co., Harvey, Ill., Athey Products Corp., Chicago, Indiana Steel Products Co., Valparaiso, Ind., and Globe Steel Tubes Co., Milwaukee.

—o—

Carl P. Riegger, 74, general purchasing agent, Grinnell Corp., Providence, R. I., died recently. He was associated with the company for 36 years, and served as general purchasing agent from 1925 until the time of his death.

—o—

Cyril P. Turner, 51, regional manager for Studebaker, died in Los Angeles Mar. 5. Mr. Turner, a native of Canada, came to the United States in 1919 to join Studebaker. He later became associated with Nash Motors, and until last year served with that company as assistant sales manager.

—o—

Anton Felin, 64, a tool designer in Cleveland for 45 years, and former owner of Highland Tool Co., Cleveland, died recently.

—o—

Raymond E. Hall, 52, general superintendent of the overall operations of Kellogg Mfg. Co., Rochester, N. Y., a division of American Brake Shoe Co., died recently. He had been associated with the company 32 years.

—o—

Blair Hastings, superintendent of open hearth, Warren, O., plant, Republic Steel Corp., died recently.

—o—

Roy R. Summerville, 48, manager of the New Orleans branch of Southern States Iron Roofing Co., died Mar. 7.

—o—

F. M. Manson, 59, former traffic manager for Lukens Steel Co. and its divisions, Coatesville, Pa., died recently in Harrisburg, Pa.

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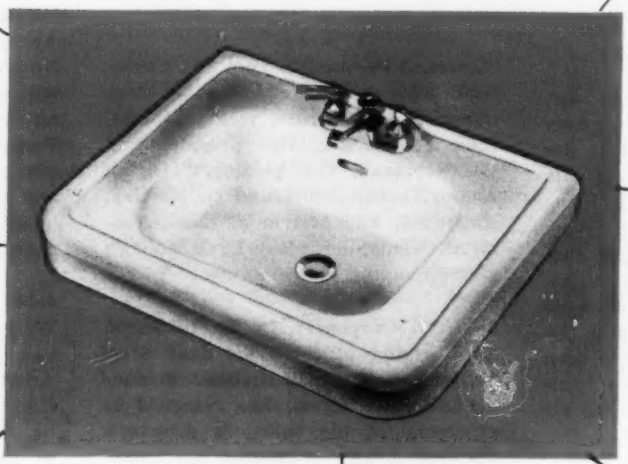
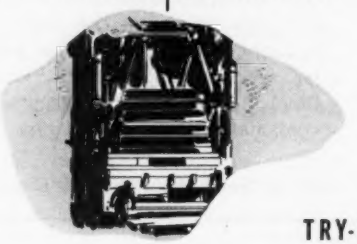


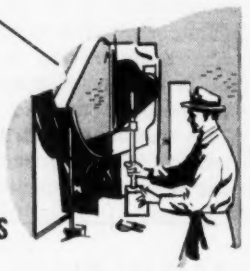
PRODUCTION DESIGN

DIE CONSTRUCTION

PART OR TOTAL PRODUCTION

TOOL AND DIE DESIGN





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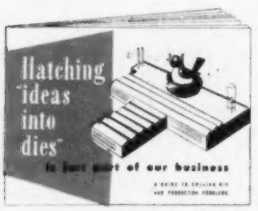

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Engineering News . . . AT A GLANCE

DOUBLE-ACTION PROCESS—Light surface rust is dissolved and scale on welded sections is softened by an improved process developed by Northwest Chemical Co., Detroit, for preparing metals for plating and vitreous enameling. The company reports that regardless of quality of steel involved, the two-tank procedure not only cleans the metal but also activates the surface of ware to condition it for a ground coat. Cleaning cycle is 5 minutes in each tank with no intervening rinse.

METAL "PITTER"—In testing resistance of various metals against cavitation or pitting caused by water or other liquids, Allis-Chalmers hydraulic engineers use a method of testing which in 2 hours subjects the sample to several years of in-service "wear." Test consists of vibrating a sample metal at a rate of 6500 cycles per second through a distance of 3 to 4 thousandths of an inch, while face of the sample is immersed in distilled water. Rapid up-and-down motion causes the cavitation phenomenon to occur under the face of the material millions of times in the brief period. Vibration is produced electronically in a nickel rod to which the sample is attached. Amount of pitting is measured by loss of sample weight during the test.

STEEL-HARDENING COMPOUND—Any carbon or high-speed steel can be hardened to any desired depth in a matter of minutes with the application of a compound developed recently by Wilson Carbon Co. Inc., New York. Hardening is done by simply heating the object to a cherry red, dipping it into the gray powder, then redipping the part in the compound after a lapse of 15 to 30 seconds, reheating and quenching in cold water.

CRYSTAL FORMER— To determine exactly why and how metals form different structures under different conditions, it is necessary to study the composition of the crystals themselves. To do this readily, a single crystal must be formed preferably of very minute thickness. This feat is now being accomplished by a new device developed in the research laboratories of Westinghouse Electric Corp., Pittsburgh. The "furnace" as it is called, forms thin, flat, single-crystal sheets, ½-inch square and only 10 mils thick from a pure metallic sample. In the process the sample is heated to just above its melting point in the best possible vacuum, then cooled very slowly and evenly to form the crystal. Electron and x-ray diffraction tests are used to study the cell structure of the formed crystal.

ROVING TRUCKERS— Roving trucker system used in the 50-acre production area of Pratt & Whitney Aircraft, Hartford, Conn., not only is increasing operating efficiency of each of 132 industrial trucks, but is responsible for equalizing work distribution. In this system the roving truckers play almost as important a role as the dispatcher who receives truck-service requests from various departments. As each trucker accomplishes his mission, for example, he calls the dispatcher from the nearest phone instead of reporting to a central station. This enables the dispatcher to assign him another hauling task right in the same area. Although telephone "mileage" increased to an average of 350 calls per day, a great deal of backtracking and empty truck mileage was eliminated.

STEPS UP FORGING—Electric induction heating system used in the Wooster, O., plant of Timken Roller Bearing Co., for raising to forging temperature a continuous piece of bar stock in producing removable rock bits, continuously heats and intermittently feeds the stock directly to an upsetter—to step up forging operations. Hourly production is about 1500 bits. The company reports that only one heat is required for upsetting, coining and trimming. Only 28 seconds elapsed between the time the bar is heated and the finished rock bit forging emerges at the end of the production line. (p.66)

SERVICE PLUS—Besides installing equipment for "gearing" up its materials handling activities to place all steel deliveries on a rush basis—Benjamin Wolff & Co., Chicago warehouse, also included in its newly-constructed plant facilities for a new service—metal decorating. Tinplate, black plate or aluminum sheets now are delivered color-coated to customer specifications. Coating is done on a production line that averages 21,000 sheets every 8 hours. (p.68)

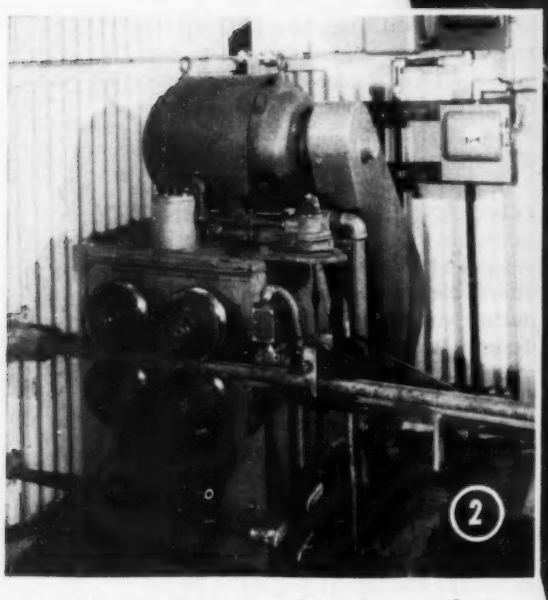
COST-CUTTING "TOOL" — Impact extrusion, a comparatively new development in the art working metals, offers definite opportunities for reducing costs and improving product design. It is pointed out by Aluminum Co. of America, Pittsburgh, that the one-piece construction of aluminum impact extrusions offers possibilities of eliminating two or more parts through simplification of design or operations required to obtain desired design details. Many users contend parts ordinarily designed for spinning, stamping etc., may be altered to advantage when using the process. (p.72)

FIVE-ZONE HEATING—Doughnut-type rotary hearth furnace at the No. 2 seamless tube mill at the Gary, Ind. plant of National Tube Co., is reported to be the first furnace of its kind in the industry—incorporating five separate walled zones for heating billets prior to piercing operations. The installation places the mill in a much better position of supplying high-quality specialty tubing which is made in large variety of sizes of precise dimensions in varying grades of carbon, alloy and stainless steels. (p.88)

CONTINUOUS INDUCTION HEATING SETUP

Expedites rock-bit

By W. J. ASSEL
Chief Engineer
Steel and Tube Division
Timken Roller Bearing Co.
Canton, O.



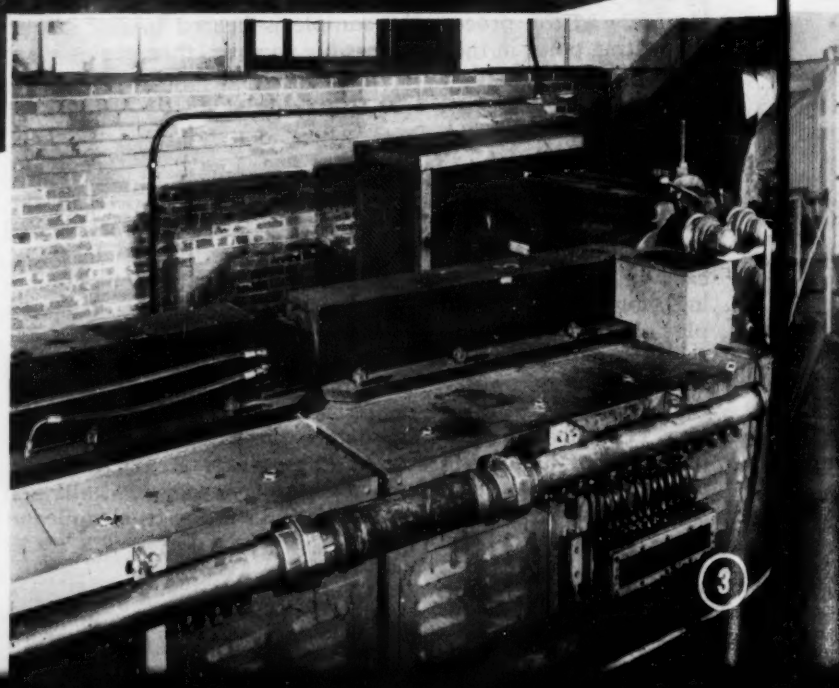


Fig. 1—Platform where bar stock is loaded and fed by pneumatic pusher mechanism to production line inside building

Fig. 2—Roller-feed mechanism, actuated by solenoid control, advances bar stock into induction heating coils

Fig. 3—Tocco inductor coils. Bar is heated to 1500° F in first coil and up to 2150° F in second coil. Note heated bar emerging at right of picture

Fig. 4—View of rock-bit production line at Timken's Wooster, O., plant. From left to right the following are visible—induction heating coils, continuous forging machine, forging press and trimming press

forging

UTILIZATION of electric induction heating for raising to forging temperature a continuous piece of round bar stock used in the production of removable rock bits at the Wooster, O., plant of Timken Roller Bearing Co. offers many advantages over old-type conventional heating procedures. Previously, it was believed to be uneconomical to heat forging stock by this method; however, experience at this plant shows that a cleaner more uniform forging is produced, less steel loss is experienced due to the lack of scale and lower worker fatigue results because of the absence of excessive shop heat.

The pilot installation, one of three continuous production lines to be eventually installed, was designed by the company's engineers with induction heating units being designed and installed by Tocco Division of Ohio Crankshaft Co., Cleveland. This is the first commercial installation in which continuous lengths of heated bar stock are served directly to an upsetter in the continuous production of removable rock bits.

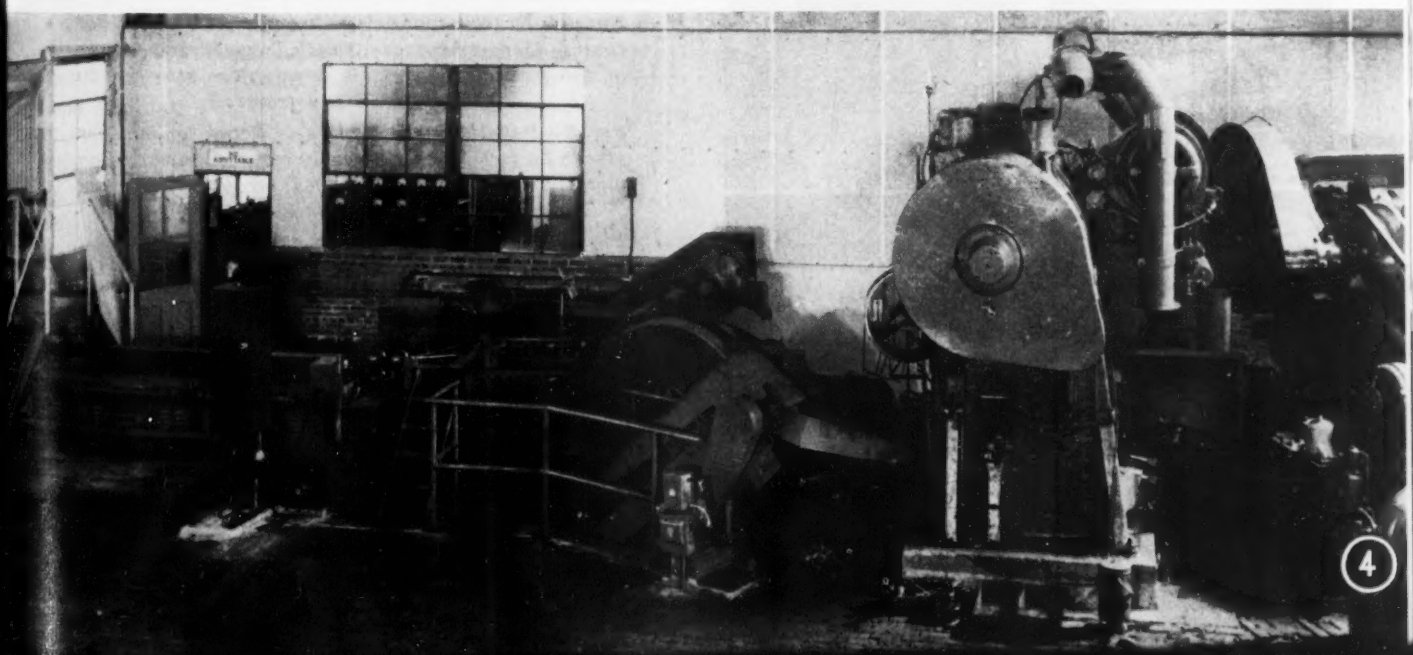
This induction heating installation is noteworthy because of two related factors. It is the first installation where bar stock has been continuously heated and intermittently fed to an upsetter rather than first being sheared into slugs, heated and then fed to the upsetter. The second factor of importance is the amazingly high conversion rate of 5.38 to 7.35 pounds, depending on diameter of bars, per kilowatt hour heated to 2150°F. One reason for this unusually high efficiency is that the bar is heated continuously—whereas slugs do not form a continuous mass. Efficient coil design, naturally, is another factor contributing to the high conversion rate. Two coils in series are employed. Coil No. 1 heats the bar past the curie point to approximately 1500°F. The second coil raises the temperature from 1500 to 2150°F. The first coil employs 245 kilowatts of high frequency power and the second coil 190 kilowatts. Both coils are 43¼ inches long, have an inside diameter of 3 inches and are constructed of rectangular copper tubing. Both are water cooled and have nichrome guide tubes on which rests the bar to be heated. Coil No. 1 has 62 turns and coil No. 2 has 54. Electrical generating equipment for this installation consists of 3000 cycle motor-generator units.

Temperature is checked by electric eye control with signals available to the operator for showing any deviation from desired temperature. A combination of red, white and green lights are used for this purpose. A red light shows temperature higher than 15 degrees above heat desired. Red and white means up to 15 degrees above heat desired. White indicates temperature is exactly as desired; green and white, up to 15 degrees below temperature desired.

Analysis of the bar stock used is SAE 1095 modified, which is secured in 16 to 20 foot lengths of 1-9/16 inches diameter for producing a rock drill bit of the D-3 type. Raw material is delivered in 50 bar bundles to an outside charging area in which the feed-table is located. This setup is shown in Fig. 1. Manual loading is used for placing material on the table, which automatically advances in the next bar when the preceding bar has entered the building and has partially entered the induction heating units. A pneumatic pusher-feed mechanism utilizing a limit switch actuated by solenoid control starts the next bar moving into position for entry into the line. After material is heated to forging temperature a 4½-inch slug is cut off and upset.

Hourly production of the setup is approximately 1500 rock bits. One heat is all that is required for upsetting, coining and trimming operations. Only 28 seconds elapse between the time the bar is heated and the finished rock bit forging emerges from the end of the production line.

Reduction of scale from 2.79 per cent to 0.79 per cent saves 2 per cent of total steel weight. Because of uniform heating and lack of scale, savings in life of forging dies have also been experienced.



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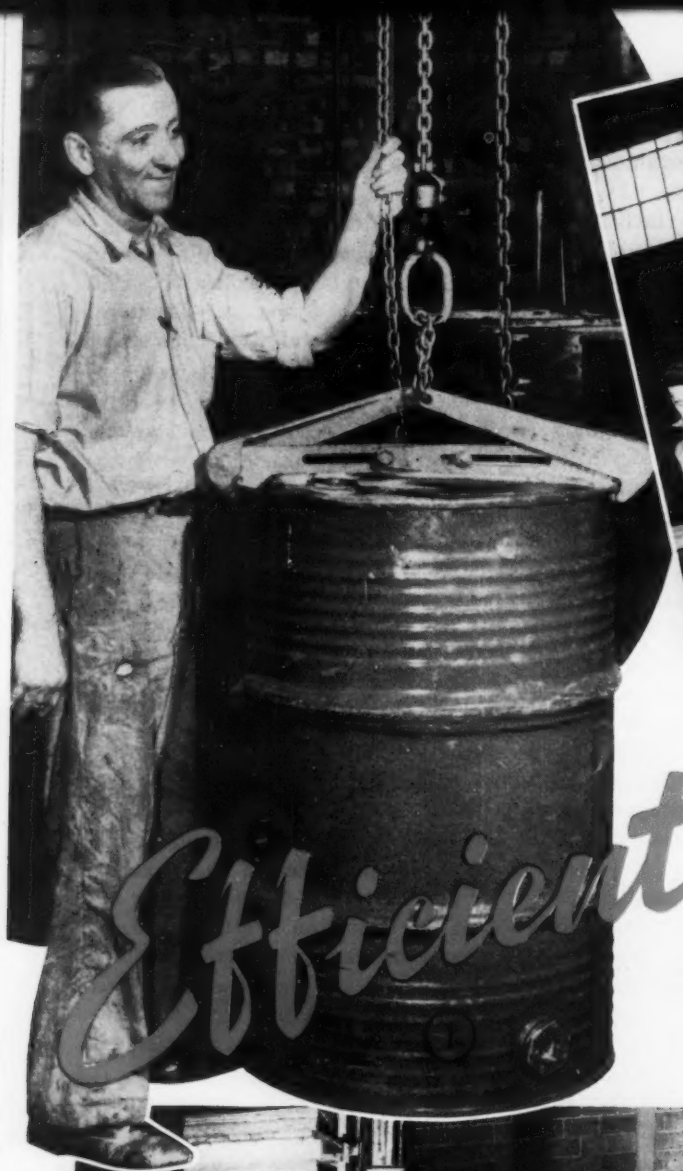


Efficient Warehouse

POSTWAR shortages of steel and other metals which have limited inventories of metalworking plants to below-normal, insecure levels, forcing acquisition of materials on hand-to-mouth basis, has made it necessary for many consumers to rely heavily upon the quick accommodation offered by warehouses. Although themselves handicapped in supplies resulting from irregular and inadequate receipts from mills, warehouses have nonetheless rendered outstanding service to their customers.

Most noteworthy in this service is the speed with which a warehouse gets ordered material into the buyer's hands. Recognizing that metalworking plants lack inventories, a reliable warehouse automatically

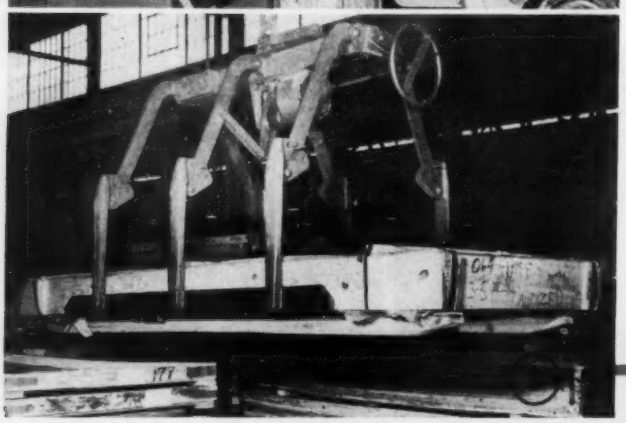


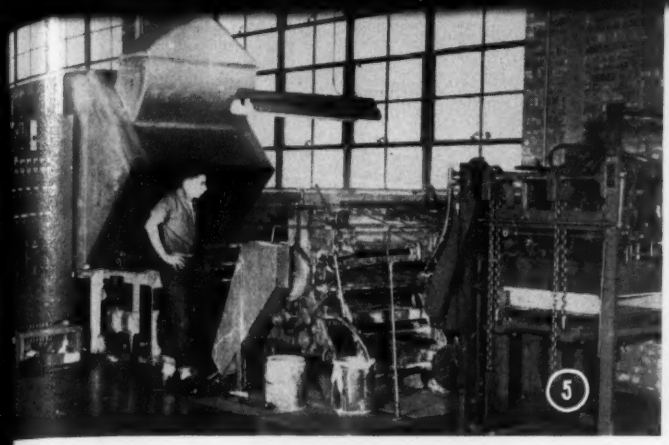
Fig. 1—Drums containing finishes used in metal coating department are handled easily and safely in the paint room by this drum lifter attached to a hand block and tramrail

Fig. 2—Palletized black plate is tiered up in close stacks by fork truck and easily removed in the same manner. Each pallet is tagged for gage, size and number of sheets

Fig. 3—Boxed material, such as stainless steel and aluminum sheets, are handled into and out of inventory by overhead crane and sheet lifter

Fig. 4—Steel angles are removed from stock inventory by overhead crane and chain sling and loaded onto a truck for delivery to the customer

Fig. 5—Entrance end of metal coating line. Palletized sheets placed in the feeder at right are fed automatically one at a time through the coating rolls and deposited on the continuous conveyor of the oven



By ERLE F. ROSS
Chicago Engineering Editor, STEEL
Photography by Dan Reebel

Handling Effects Deliveries on Rush Basis

assumes that the ordered material may be required for immediate use.

For a warehouse to be able to accommodate customers speedily and efficiently requires good management, good materials handling and good housekeeping. Incoming shipments from mills, whether by railroad car or truck, must be unloaded quickly and transferred to proper location in stock storage. Good inventory control must be maintained and methods of stocking must be such that designated quantities can be removed easily for dispatching to a customer.

A Chicago district warehouse which prides itself on adherance to these principles of operation is Benjamin Wolff & Co., which late last year celebrated its thirty-first anniversary. The company handles carbon steel in bars, plates, structurals, sheets and expanded metal; stainless steel sheets; aluminum in sheets and rolled shapes for structural work, fabricated and screw machine products; copper sheets; and tin plate.

When an order for material is received, it is taken for granted that it is rush. Consequently, the order is dispatched automatically that same day for following morning arrival at distant points. Same-day service is given frequently if delivery is a local one.

Capacity of the warehouse was increased substantially not long ago when a new addition was built. Incoming material enters the plant on a switch track along one side having room for three box cars and two gondolas. Unloading of the gondolas is by two overhead Northern cranes, one of 5-ton capacity and the other of 10-ton. These cranes operate on runways which are at right angles to the switch track and by means of chain slings, sheet lifter, or appropriate handling devices, material removed from the gondolas is stacked in areas beneath the runways.

Material stored in the two bays served by the cranes is limited to steel bars, plates and structurals and boxed stainless steel and aluminum. When this material is required to fill orders, it is picked up by crane and loaded onto trucks which enter the warehouse on the side opposite the railroad switch track. Fig. 4 shows one of the cranes loading steel angles on a truck by means of a chain sling. In Fig. 3 is shown use of the second crane with Cullen-Friestedt sheet lifter removing from a tiered-up stockpile a crate containing 4000 pounds of aluminum sheets.

To facilitate unloading of box cars, a concrete dock of car floor height has been built along the switch track. When a steel plate is used to bridge the dock and box car, a fork truck moves into the car and removes palleted tin plate or black plate. As pallets are removed from the car, they are temporarily stacked on the dock, as depicted in the same illustration. When the car has been unloaded, the fork truck transfers the pallets down a gentle ramp from the concrete dock to inspection benches and later to their proper area on the warehouse floor.

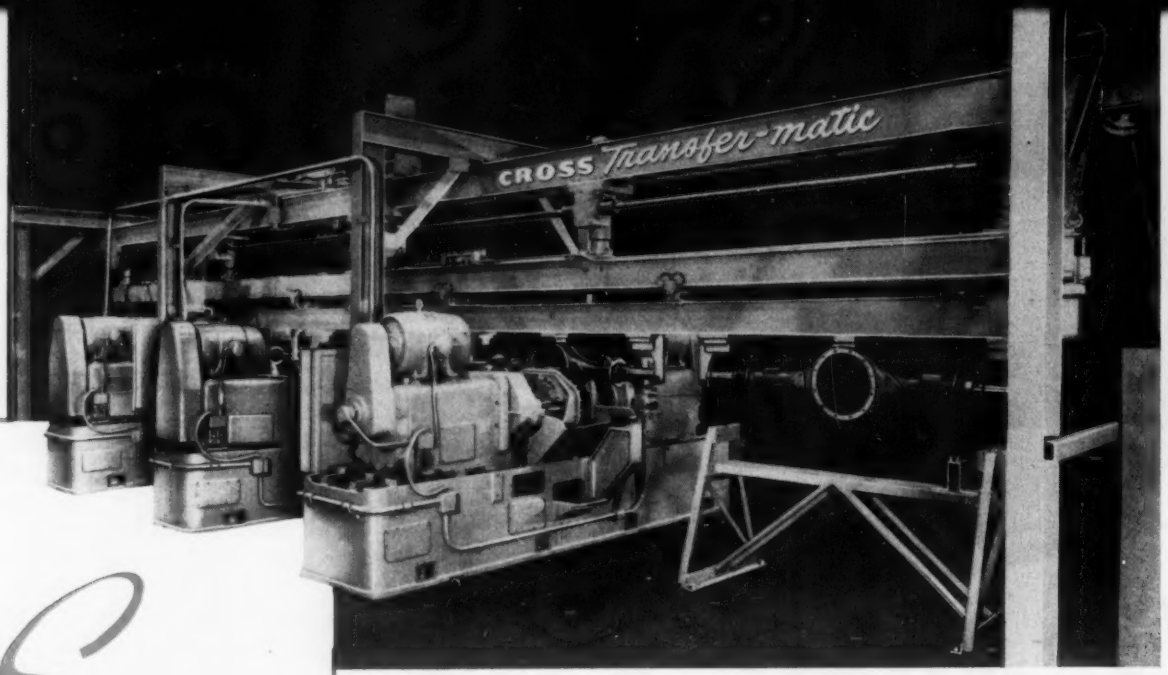
Because the fork truck is capable of maneuvering in close quarters, tin plate or black plate can be tiered up from 7 to 9 feet in close piles, with minimum width aisles intervening. This makes for maximum utilization of floor space. In Fig. 2, a fork truck is shown removing two pallets of black plate from a tiered-up pile of stock.

Metal decorating is a new customer service which this organization made available recently when it installed a coating line. On this line, situated in a spacious bay of the recently-constructed plant addition, tinplate, black plate or aluminum sheets are color coated to customer specifications. To speed production, the line is equipped with a Dexter feeder. Sheets, resting on a pallet, are loaded into the feeder by fork truck and are removed one at a time by rubber suction cups and fed into coating rolls. Coating is applied to one side only, after which the sheets are deposited automatically on the conveyor of the gas-heated, continuous Young Bros. oven.

Average production of the coating line is 21,000 sheets in 8 hours. Fig. 5 shows the entry end of the line with the Dexter feeder at the extreme right. Located nearby to the discharge end of the coating line is a waxing machine, used to apply a wax coating to sheets when a customer requires this finish.

All handling of palletized sheets in the warehouse and coating department is performed with Clark fork trucks, three of which are available.

Since the company coats sheets in a wide variety of colors and finishes and performs its own paint mixing, considerable quantities of vehicle, thinners and pigments must be kept on hand. These are purchased in 54-gallon drums and present the problem of storage and handling with due regard to safety. Adjacent to the coating department is a fireproof paint room and here the drums are stored upright on specially-designed steel racks about 12 inches above floor level. The room is served by a hand-operated tramrail and Yale hand block. By means of a lever-action lifter which grips the drum end rim, the drums are moved about easily and safely, Fig. 1.



Effective STATION TO STATION MOTIONS

Key to Further Machining Productivity

By RALPH E. CROSS
The Cross Co.
Detroit

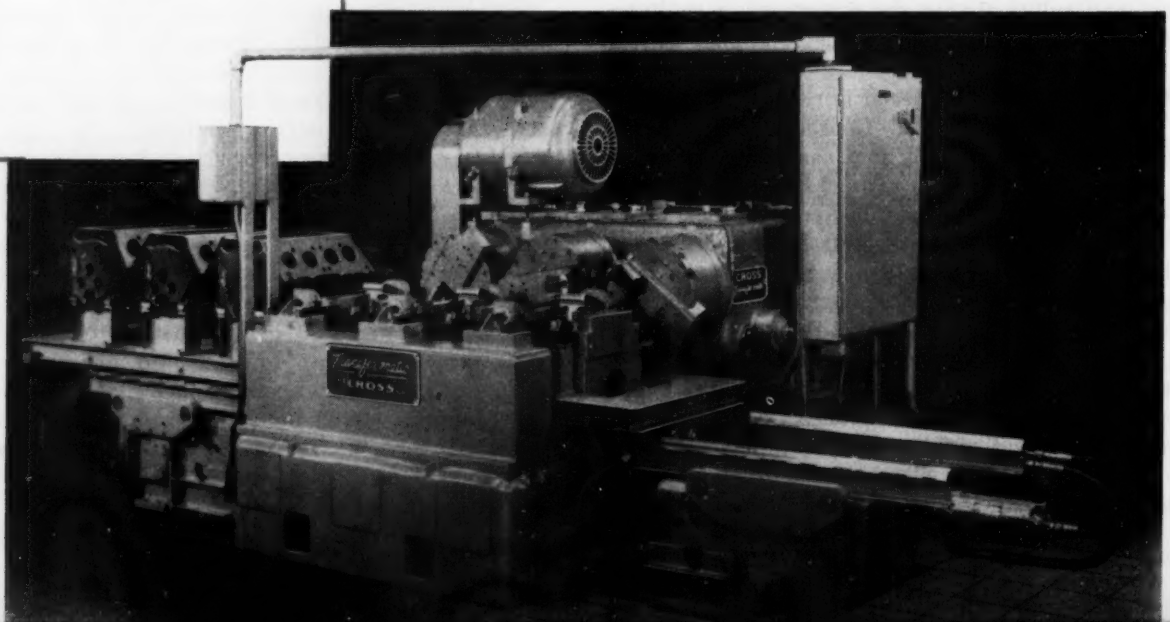
TO MEET insistent demand of the metalworking industry, machine tool builders have striven for years to increase speeds at which metal products can be machined and finished. Today, it seems probable progress in this direction has about reached the vanishing point. Any appreciable further reduction of machining time appears to be impractical.

Nevertheless, the greatest future contributions to decreased production time undoubtedly will be made by designers of special machine tools. This can be done through further development of transfer mechanisms to carry work from one station to another on multiple-station tools where each station is really a machine in itself.

Opportunities for cutting production time are far greater with such devices than are the possibilities of increasing actual cutting speeds. One authority has compared the difference to an airplane trip from Detroit to Cleveland. The actual flying time of approximately 40 minutes might be designated as machining time. The half-hour trip from downtown Cleveland (*Please turn to Page* 85)

Fig. 1 *(above)—Transfer-type mechanism designed for drilling, chamfering and tapping holes in both sides of the banjo face of heavy-duty truck axle housings*

Fig. 2 *(below)—This machine was designed for finishing transmission joint faces square with the crankshaft bore on V-8 engine blocks at an hourly rate of* 56 *pieces*



SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

"PUTTING-ON" TOOLS: Next to the "left-handed monkey wrench", the "putting-on tool" long was the thing most sought after at the tool crib by innocent beginners in the machine shop. No longer, however, is the putting-on tool one of the implements of machine shop horseplay. Today it actually exists in the form of metal spraying apparatus. It is not a simple tool, however.

This fact was impressed upon a large and attentive audience at the recent annual meeting of the American Society of Tool Engineers in Pittsburgh, by Walter B. Meyer, secretary, American Metallizing Contractors Association. As manager, metallizing division, John Nooter Boiler Works Co., St. Louis, Mr. Meyer spoke from personal experience when he said that metal spraying today stands about where welding stood 20 years ago. At that time welding primarily was employed on repair and reconditioning work.

Today welding is widely recognized as a basic process in the design and fabrication of products in production. Today metal spraying is just beginning to gain attention in the latter respect. It is not a cure-all, and very definitely it is not a technique to be practiced causally by amateurs using glorified spray guns. As Mr. Meyer put it: "The reiterated statement that any intelligent mechanic can learn to metallize in a few hours definitely is not correct."

I could well believe that after hearing Mr. Meyer discuss the widely differing characteristics of 27 kinds of metallizing wire; five basic methods of surface preparation; molecular bonding cohesion between particles; relation of the galvanic series to corrosion resistance; etc.

Over the years I have seen tool engineers successfully absorb into their systems many a technique as tough as this one. Invariably there are some attacks of indigestion in the early stages. There were many aches and pains in the digestion of carbides into the tool engineering system, for example. Mr. Meyer's forthright presentation at Pittsburgh did a lot to help tool engineers to digest metallizing without too many aches and pains.

SAVE THE FINGERS: A stunt man asked a doctor: "What is the best way to get a billiard ball out of my mouth?" The doctor's prescription was: "Don't put it in your mouth in the first place."

Joseph Karash, plant and process engineer, Reliance Electric & Engrg. Co., Cleveland, has a similar answer to the problem of human hands and fingers in punch press dies. In the belief that the law of averages proves that loss of hands or fingers is inevitable if they habitually are inserted in dies, he designs them so that stock can be fed and work removed without necessity of reaching into the dangerous areas. This involves serious thought along automatic feeding and automatic work removal lines, but the safety record achieved certainly warrants this.

There is an economic, as well as a humanitarian angle to all this. As Mr. Karash explains it: "Any operation requiring an operator to reach into the danger area to place, remove, hold or position material cannot be operated on repeat stroke. There must be complete stoppage of the ram at each stroke to make sure that the operator's hands are safe before tripping the ram.

"Single stroke operation is fatiguing because of the necessity for the operator to stand on one foot when using pedal control. This fatigue factor is aggravated by the fact that it requires intense concentration and exact synchronization.

"Repeat stroke, on the other hand, sets an even, steady tempo which 'paces' the operator. It enables the operator to stand comfortably on both feet. It can only be employed, however, when the die is designed and built so that the operator never is required to reach into the danger area—and the press screened to prevent any such reaching in."

THE WORKERS' SHARE: I have seen many ingenious methods employed in annual reports of machine tool builders to depict the relative proportion of annual income devoted to each major phase of operations. One of the most ingenious is that used by Warner & Swasey Co., Cleveland, in its 1948 report.

An operator is shown using a parting tool on a round billet chucked in a heavy duty turret lathe. This billet represents the 1948 income of $18,894,945. From this the operator has cut off a thin wafer representing "dividends"—1.07 per cent of the whole; a disk representing "taxes"—2.98 per cent; a big chunk representing "amount paid to or for employees"—50.28 per cent; another disk representing "depreciation"—2.36 per cent; and a final chunk gripped in the chuck representing "materials, supplies and services"—41.35 per cent. Below the work is a small pile of chips representing "amount reinvested in the business"—1.96 per cent.

This serves as positive proof that those who profit most from American industry are the workers in American industry. All that and individual freedom too!

BULLARD-UNIVERSAL: The trend toward mergers and combinations within the machine tool industry continues. As this page was about to go to press, word came to me that Bullard Co., Bridgeport, Conn., has acquired the business and products of Universal Boring Machine Co., Hudson, Mass.

Although transactions such as this certainly are reducing the number of machine tool companies, they undoubtedly strengthen the industry as a whole by broadening and stabilizing its activities.

Opportunities for reducing costs and improving product design are offered by this relatively new technique in working metals

IMPACT

IMPACT extrusion, a comparatively new development in the art of working metals, offers definite opportunities for reducing costs and improving product design.

In forming a shell or part by this process, as described by Aluminum Co. of America, Pittsburgh, a relatively thick disk or slug, placed in a die, is struck by a punch with sufficient impact force to cause the metal to flow, or squirt, upward through the space between the punch and die. Fig. 1 shows production steps. Specially constructed blanking dies are used in the preparation of slugs for the extrusion of a variety of standard round, square and rectangular shells.

Resultant products from this process, might be described as cup-shaped parts having cold-forged bottoms combined with extruded sidewalls. Approximately full-hard properties of aluminum are developed by the process, resulting in strong and rigid parts adequate for many applications. The one-piece construction of aluminum impact extrusions offers possibilities of eliminating two or more parts through simplification of design, or expensive and time-consuming operations frequently required to obtain desired design details. It is contended many parts ordinarily designed for drawing, spinning, stamping, or turning may be altered to take advantage of the inherent reduction in production costs and fabrication time offered by the process.

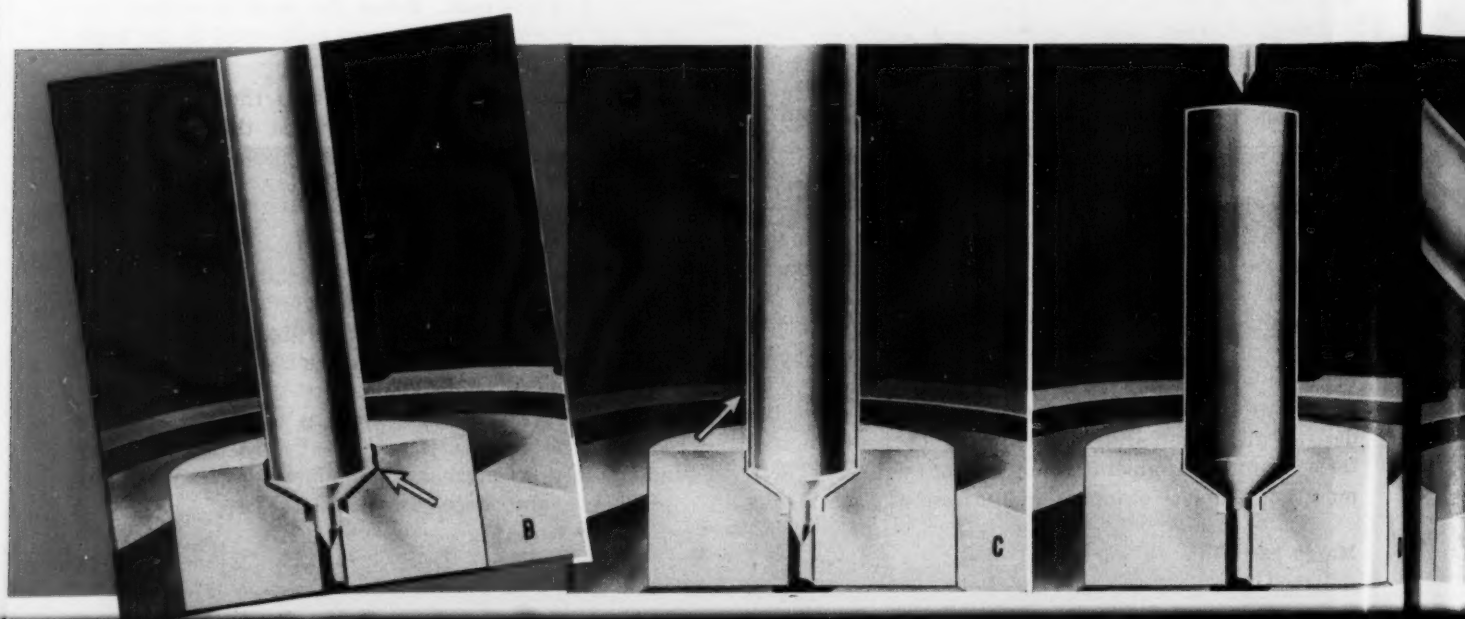
Design of impact extrusions also may provide for the elimination of certain costly machining operations on the finished part. The combination of impact extrusions and limited finish machining operations where necessary is a cost-saving device applicable to many types of extruded parts. Examples of these end products are shown in Fig. 2. While it may not be possible to eliminate completely the need for machined surfaces, the extent of required machining is reduced appreciably.

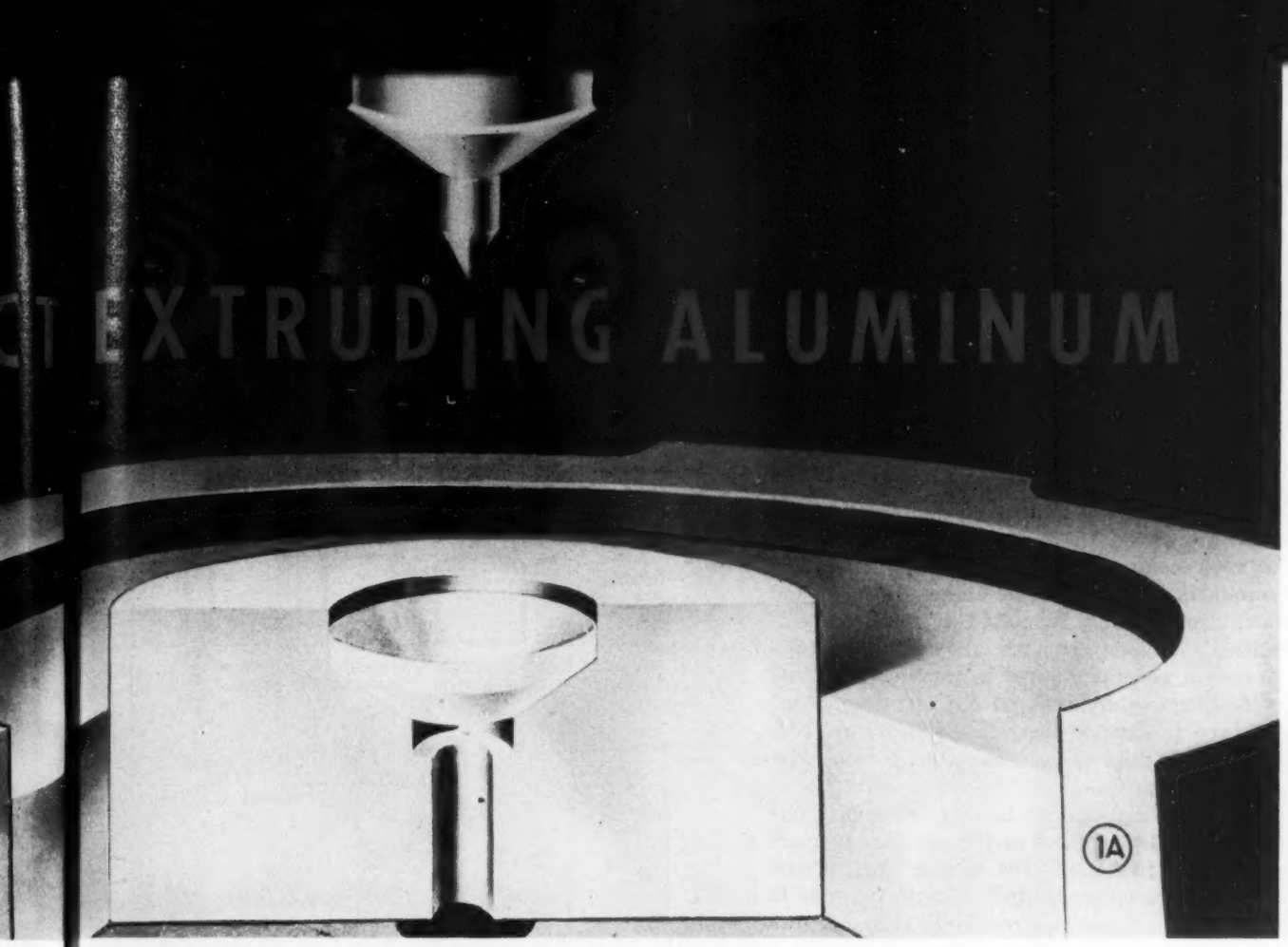
In one sense, the applications for impact extrusions and drawn shells overlap; in general, however, the products of each process have their clearly defined field.

Fig. 1—Five major steps in impact extrusion process. Operations begin when the slug is automatically fed into a die cavity of an electrically-operated crank press. Inside diameter of the extruded shell is determined by the outside diameter of punch. Punch is forced downward with terrific force, striking slug and squirting metal upward and around punch. Simultaneously some metal from slug flows downward to form tube's neck and orifice. When punch is withdrawn, formed tube is stripped from punch and carried away to the next operation

Cost of extrusion tooling, with few exceptions, is said to be considerably less than that of the tools used in the drawing process. This is especially true where the length of the shell is sufficient to require several drawing operations, since with the extrusion process it is possible to produce a shell of extreme proportions with but one operation and with but one set of tools by merely varying the volume of the blank or slug.

Nature of the extrusion process also makes it possible to produce shells with relatively sharp bottom corners. Internal fillets add reinforcement at this point and give strength and rigidity to the extruded





shell while the severe cold-working which the metal receives produces unusual stiffness in the shell as a whole.

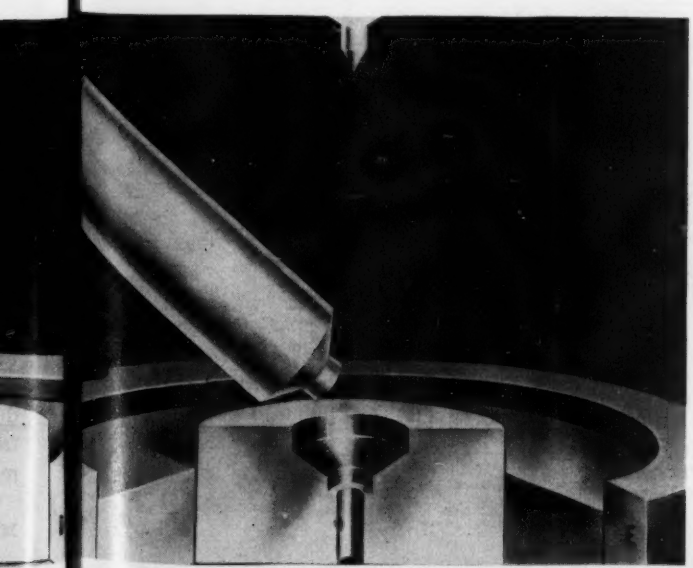
Many drawn shells of irregular shape or with tapered or curved sidewalls cannot be duplicated by the extrusion process. Conversely, many modifications of the straight-side shell can be made only by this process. Such modifications include heavy bottoms with bosses, lugs, rivets, stems, necks, indentations or embossings, Figs. 3 and 4.

Another advantage obtainable by the process is the possibility of variable wall thicknesses, which feature may be useful from a mechanical standpoint or to achieve a desirable decorative effect, Fig. 5.

Design Factors—Since the extrusion punch must be held some distance from its striking end and usually penetrates but a small fraction of the extrusion length into the die, any lack of symmetry in the sidewalls of the shell tends to create lateral pressures, which in turn force the punch out of line. Also, when inside or outside bosses or cavities on the bottom end of the shell are not reasonably symmetrical, there is a tendency for the irregular flow of metal to force the punch end out of line. These conditions adversely affect dimensional control relative to wall thicknesses, concentricity, straightness, etc., as well as creating serious tool hazards that tend to increase costs of manufacture.

Tendency for the extrusion punch to drift laterally in the die and thus cause variations in wall thickness can be minimized by several methods. Beveling or tapering of the punch end is more commonly used and has been adopted as characteristic of most parts produced by this process. This beveling also has the effect of reducing pressures required for extrusion since it facilitates the flow of metal out of the die. Where bottom design permits, somewhat better results are obtained by incorporating a small "center point" or raised boss, centrally located, which provides further impedance to the lateral deflection of the punch.

Fig. 6 illustrates the desirable design characteristics contrasted with those which will present difficulties in the manufacturing process. Although hollow items of considerable height can be produced with one stroke of the press by this process, a maximum



All illustrations courtesy Aluminum Co. of America

length-diameter ratio of 6 to 1 is considered most practical. This ratio is established on the basis of the inside diameter of the part to be produced and is attainable only with the use of the best tool steels available. Equipment and techniques have been developed to produce shells as large as 5 inches in diameter and up to 16 inches long.

Extrusion pressures are largely influenced by the bottom area, length, wall thickness and type of aluminum alloy shell to be extruded. Based on the above factors, the minimum wall thickness shown in Table I for various diameters has been established. Heavier wall thickness can, of course, be produced.

Aluminum Alloys — Commercially pure aluminum (2S) in which about full-hard properties are developed, is most commonly used alloy for impact extruded products. Other suitable alloys are A51S and 61S, which are generally furnished in the heat-treated condition. Higher strength alloys such as 17S and 14S are, in general, limited to thick sections and each application requires special consideration. Pressures required to extrude these latter alloys are considerably higher than those encountered with commercially pure aluminum.

Of considerable importance to this extrusion process has been the development of intermediate tempers for A51S and 61S suitable for certain applications. This temper offers better control of distortion due to heat treatment, and provides relatively high strength properties, as well as machining characteristics which are comparable with these alloys in their fully heat-treated condition.

Typical mechanical properties of those alloys generally used for impact extrusions are presented in Table II. In the case of nonheat-treatable 2S alloy, both H16 and H18 properties are listed since the extruded part usually possesses properties in this range.

Tolerances—It is often difficult to predetermine the

Fig. 2—Wide variety of aluminum end products and shapes made by the impact extrusion method

Fig. 3—Heavy bottom combined with a side wall of thin gage

Fig. 4—Bottom design including bosses, hollow or solid studs, necks, plug caps or cavities on inside or outside of shell

Fig. 5—Wall design of varying thickness in cross-section, or with longitudinal ribs either internally or externally applied

Fig. 6—Desirable design characteristics contrasted with those which will present difficulties in the manufacturing process

Fig. 7—Standard internal and external heads

Fig. 8—Examples of special beads

Fig. 9—Special types of flanging

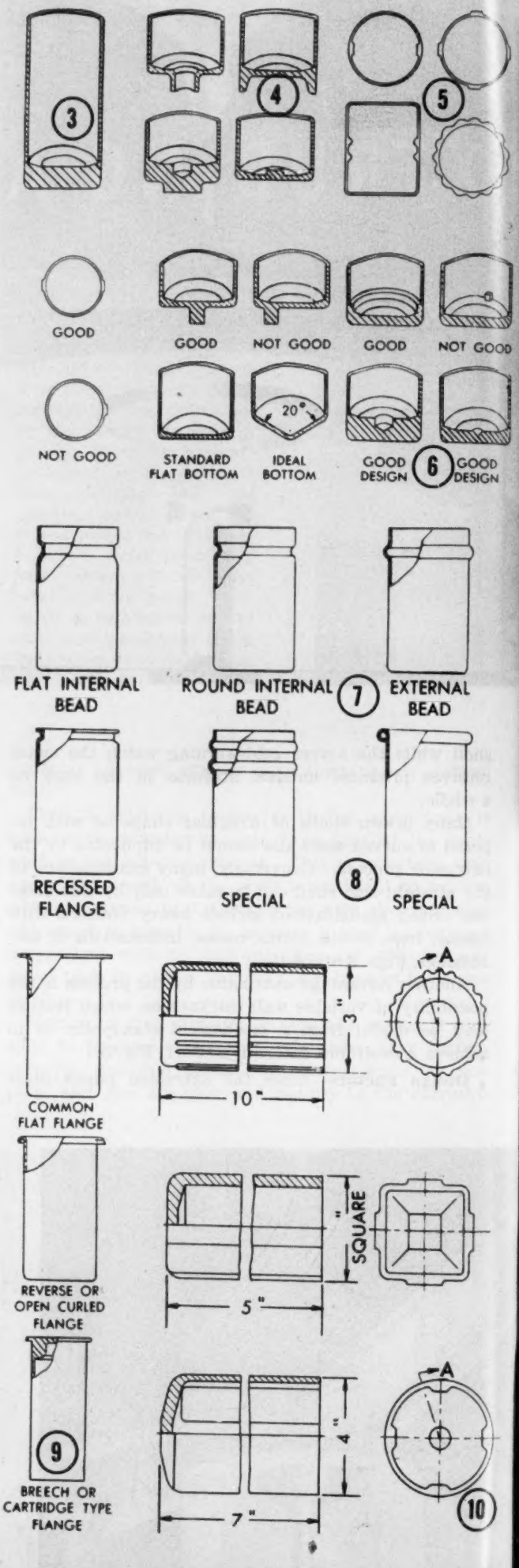
Fig. 10—Typical heavy wall shells

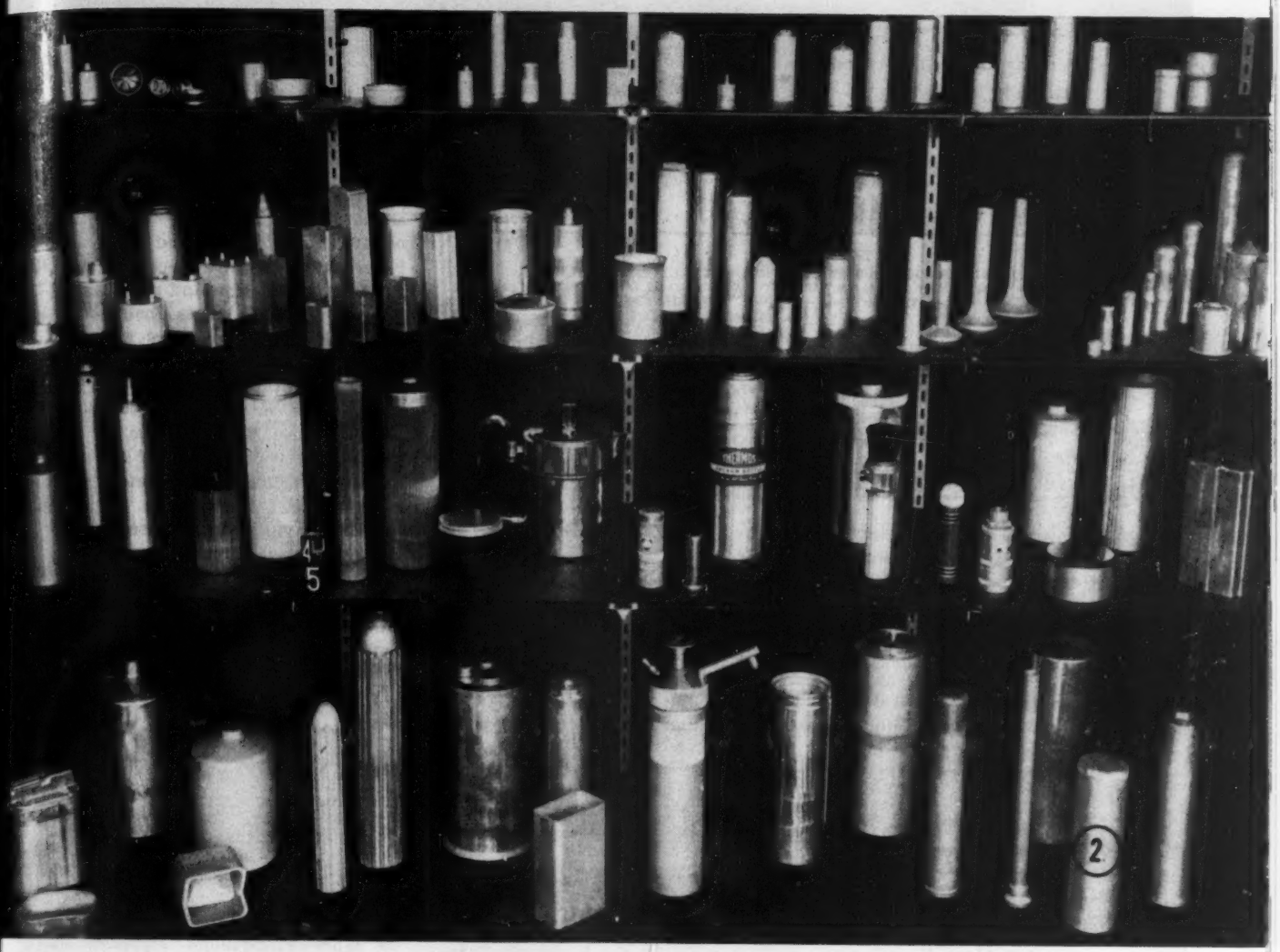
Fig. 11—Design of square and rectangular shells. Both types incorporate characteristic angular fillets at junction of sidewalls and bottom. It is good practice to make height of fillet equal to radius incorporated on outside bottom of shell

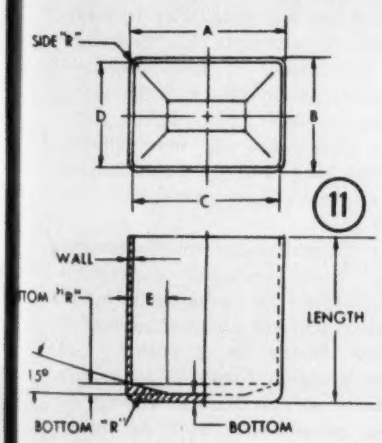
Fig. 12—Design of round flat-bottom shells

Fig. 13—Flared designs

Fig. 14—Typical machined impact extrusions



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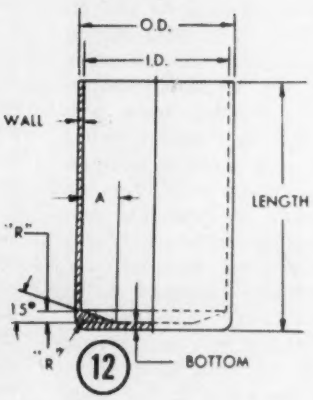
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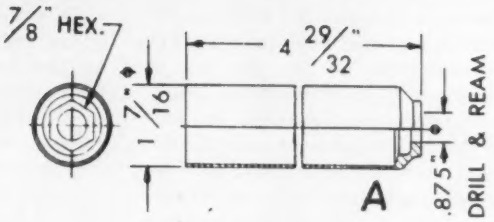
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DRILL & REAM
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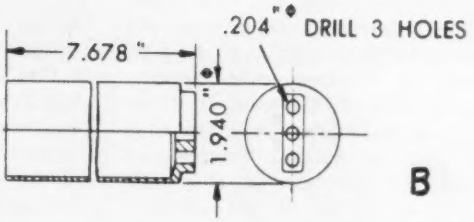
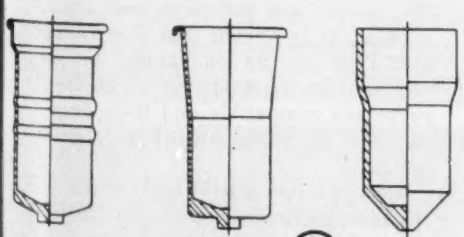

.204" ⌀ DRILL 3 HOLES
7.678"
1.940"
B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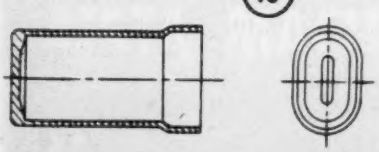

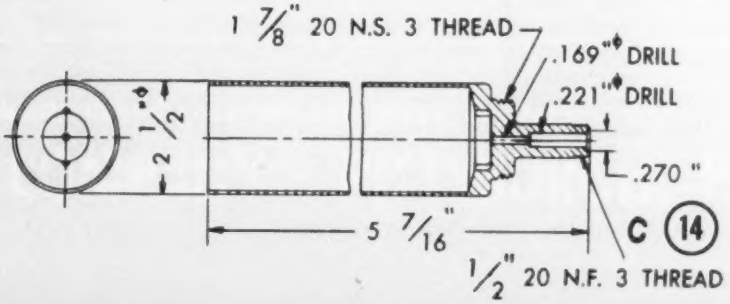
1 7/8" 20 N.S. 3 THREAD
.169" ⌀ DRILL
.221" ⌀ DRILL
1 1/2" ⌀
2 1/2"
.270"
5 7/16"
C
14
1/2" 20 N.F. 3 THREAD

TABLE I

APPROXIMATE MINIMUM WALL THICKNESS FOR ALUMINUM IMPACT EXTRUSIONS

Diameter of Shell, Inches	MINIMUM WALL THICKNESS INCH 2S Alloy	A51S and 61S Alloys	Diameter of Shell, Inches	MINIMUM WALL THICKNESS INCH 2S Alloy	A51S and 61S Alloys
¾	0.010	0.062	3	0.025	0.094
1	0.015	0.062	3½	0.025	0.125
1½	0.020	0.062	4	0.030	0.125
2	0.020	0.094	4½	0.040	0.156
2½	0.020	0.094	5	0.075	0.156

TABLE II

TYPICAL MECHANICAL PROPERTIES OF WROUGHT ALUMINUM ALLOYS COMMONLY USED IN IMPACT EXTRUSIONS

Alloy and Temper	TENSION Yield Strength (Set=0.2%) Lb./Sq. In.	TENSION Ultimate Strength Lb./Sq. In.	TENSION Elongation % in 2 in. Sheet Specimen (1/16 in. Thick)	HARDNESS Brinell 500-kg. Load 10-mm. Ball	SHEAR Shearing Strength Lb./Sq. In.
2S-H16	18,000	20,000	6	38	12,000
2S-H18	22,000	24,000	5	44	13,000
A51S-T6	43,000	48,000	17	100	32,000
A51S-T82	37,000	40,000	12	80	24,000 (Approx.)
61S-T6	40,000	45,000	12	95	30,000
61S-T82	35,000	38,000	7	75	23,000 (Approx.)

extent of dimensional variation which may occur in parts of special design; consequently they must be subject to development before firm working limits may be established, Figs. 11 and 12.

Slugs to be used to extrude shells of heavier than standard wall thickness are produced by sawing aluminum rod or shapes of the proper diameter or cross-section. Typical heavy-walled shells, Fig. 10, illustrate the versatility of the process. Lugs, bosses, stems or necks made integral with the closed end offer the designer opportunities to reduce machine, welding or assembly costs.

Basic impact extruded shell products may be further fabricated in many ways. For example, the common types of beading operations, such as those shown in Figs. 7 and 8, are readily possible to accommodate sealing, provide additional strength or to enhance appearance. The most common types of flange designs readily adaptable to the secondary design of extruded shells, Fig. 9, generally require special tooling for each application and may be limited at times to parts made of 2S alloy. Flaring also offers a variety of design possibilities, Fig. 13, sometimes facilitating assembly with other parts, or providing functional or decorative detail to the finished part. This special type of work requires individual application.

Advantage of integral lugs or bosses, heavy bottom characteristics and other special features which may be added to the design of extruded parts will often give the designer the simplicity he is seeking. Typical examples illustrating the combination of basic extrusions and subsequent machining are clearly shown in Fig. 14.

New Books

Engineering The New Age, by John J. O'Neill; cloth, 320 pages, 5¾ x 8¼ in.; published by Ives Washburn Inc., New York, for $3.50.

This book presents the story of the individual and the role he will play in the unfolding of the new era in which all our resources will be directed toward human welfare. It presents the relationship of man to the cosmos, man to man and man to his community and finds an underlying pattern which provides a blueprint for progress.

According to the author, science and engineering are the twin giant forces in the world today and both of them, in their organized aspects, are lacking a social consciousness. He feels that development in them of a social consciousness is the next major step in cultural progress. In the opening chapters of the book there is a picture of the universe in which man has its roots, drawn in terms of the atomic energy concept and, on the same basis, a survey of the planet he inhabits. In later chapters a survey is made of engineering as an organized entity within the social structure, of the engineer as an individual and of the educational processes through which the engineer is produced. He feels that a stupendous task and a glorious fulfillment paints the panorama of the immediate future with a picture of extremely interesting possibilities.

—o—

Wear as Applied to Cylinders and Piston Rings, by Dr. F. P. Bundy, T. E. Eagan, and Ralph L. Boyer; published by Cooper-Bessemer Corp., Mt. Vernon, Ohio, for $3.50.

Operators of gas and diesel engines today are reported to get up to 100 times the life in vital engine parts that was possible only 10 years ago. Although the 10-year research project reported in this book was primarily devoted to reducing cylinder and piston ring wear in engines, the sponsoring company believes its findings so basic in principle and broad in application to be of intense interest to all other builders and large-scale users of engines, allied equipment and heavy machinery.

Complex laboratory equipment, built especially for this wear study program, and described in the book, is believed to be the only equipment of its kind in existence today. Collaborators in the writing of the book were Dr. Bundy, now with research laboratory of General Electric Co., who directed the theoretical research and laboratory experimentation; Mr. Eagan, chief metallurgist of Cooper-Bessemer, who conducted the metallurgical studies; and Mr. Boyer, vice president and chief engineer of the company, who guided the application of the principles, uncovered in the wear study, to improved engine design.

Partners in Production, a report by the Labor Committee of The Twentieth Century Fund; cloth, 149 pages, 5 x 8 inches; published by The Twentieth Century Fund, New York, for $1.50.

This fixed report on the subject of labor-management relations and public policy goes beyond the discussion of law and gets down to fundamentals. It attempts to formulate a new philosophy of labor-management relations on which both labor and management could agree. The answers given are to help clarify public thinking and to guide action in this emotionally explosive field, the report states.

Labor Committee of the Twentieth Century Fund includes employers, representatives of organized labor, economists and members experienced in public affairs. It is pointed out that the problem today is to arouse enthusiasm for production among all working people as well as other groups. While we know of the problem, we do not yet have the whole solution. It is known that men work best together, as individuals or as group, when the goals for which they strive are compatible and their energies are not being wasted in useless conflict.

Book covers goals and attitudes of labor and management as viewed by each other and delves into the basis for mutual understanding. It concludes with analysis and recommendations for labor-management harmony.

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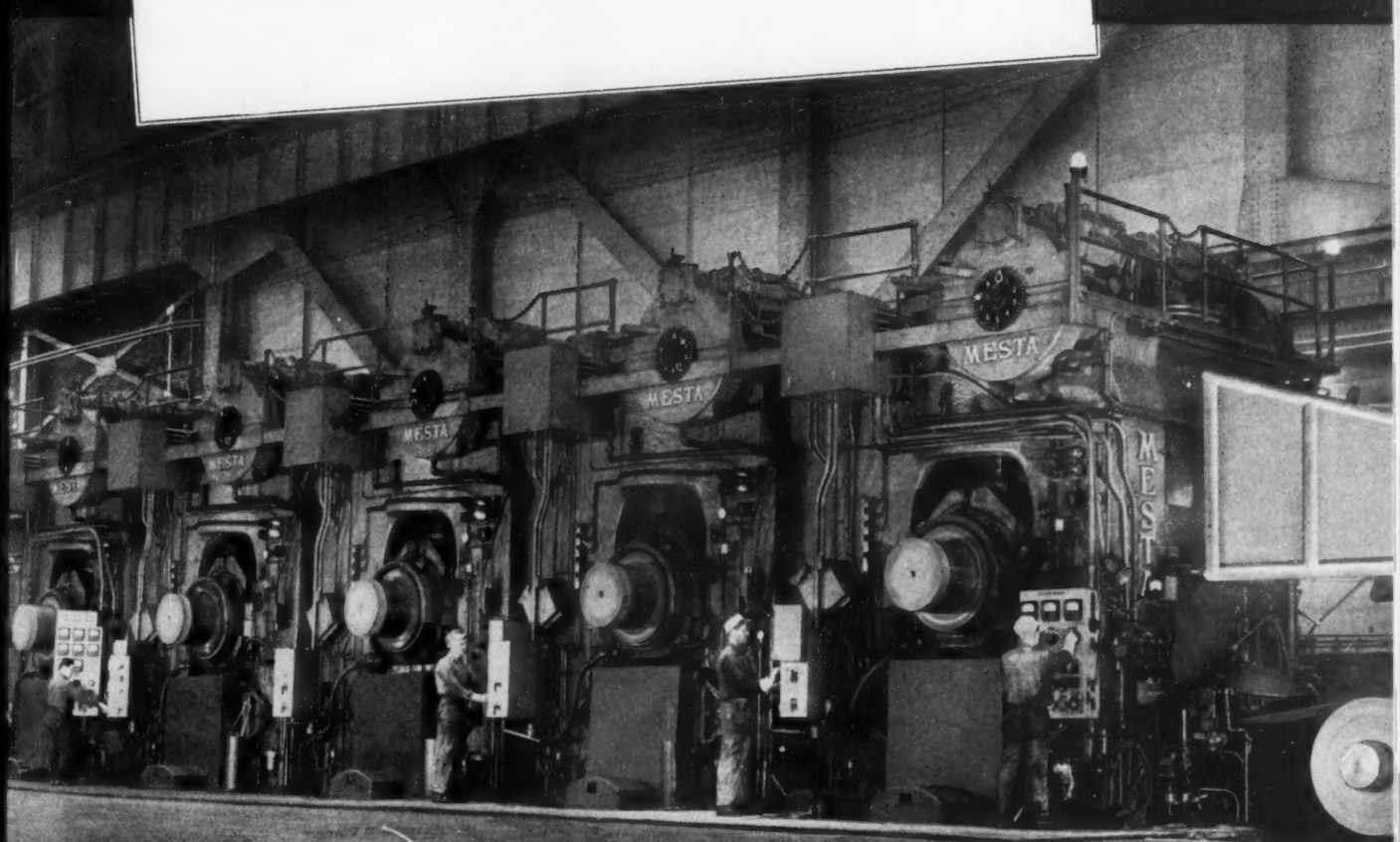

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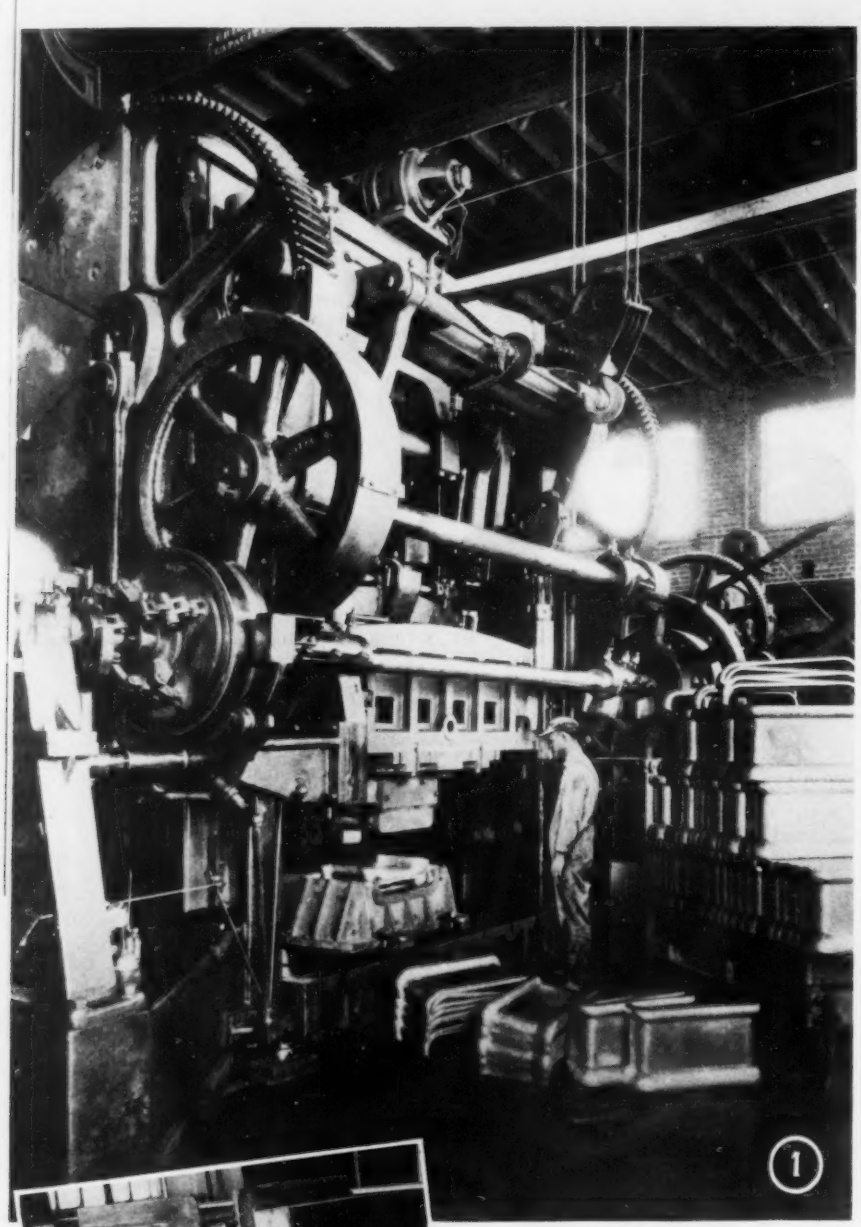

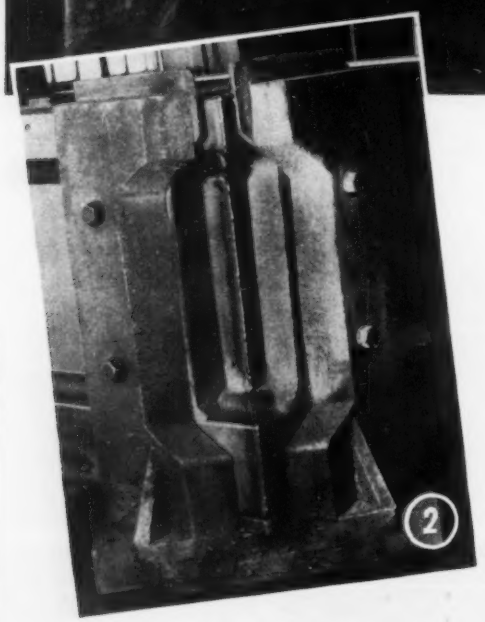

Fig. 1—Forming casket ends of 16-gage copper-bearing steel sheets

Fig. 2—Finished weld. Little spatter is encountered in this type of joint

By H. A. NEFF
President
Belmont Casket Mfg. Co.
Columbus, O.

BY using modern production methods in the fabrication of steel burial caskets, Belmont Casket Mfg. Co. has reduced manufacturing costs 50 per cent at the Bellaire and Columbus, O. plants. Forming operations take place at one plant, while the other facility is used to weld, finish and assemble the caskets.

Approximately 120,000 square feet of the Bellaire plant are used for modern press operations. Copper bearing steel sheets, ranging in thickness from 16 to 19 gage, are here formed into casket components. In addition to numerous smaller presses, the plant operates one 600-ton, one 350-ton and one 300-ton press. Two of the larger presses have capacities to form up to 12-gage sheets, 60 x 120 inches. The plant is also equipped to make deep draws up to 14 inches.

All shearing, forming and stamping operations take place here and a close tolerance control is maintained on all hardware, sides, tops and other parts involved in the assembly of the caskets. The plant has a complete tool and die room where fixtures and tools are designed and made. Fig. 1 shows the forming of casket ends.

In the 101,000 square feet of the Columbus plant, ten different styles of caskets are fabricated and assembled for shipment. Approximately 10 years ago the company began to use arc welding to improve casket construction.

By welding the metal sides, full joint strength is obtained which permits elimination of the wooden frame. In addition, it is possible to achieve a smooth finish along with completely air-tight joints. The soldered joints were subject to cracking and were a constant source of repair work. These advantages, realized through arc welding, have effected a 15 per cent reduction in cost.

Fig. 3 shows a welding operator welding the corner of a casket with a 3/32-inch diameter electrode. The electrode is a special type, called Lightweld, developed by Lincoln Electric Co., Cleveland, for welding on lightgage sheet metal. The air-operated fixture is loaded with the main body and two ends, with copper chills or backup strips at each corner to be welded. Fit-up of the ends and body is excellent. The operator first spot tack welds in each of the corners and then welds the joints vertically down,

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Fig. 3—Welding corner joints with one pass vertically down

using 70 amperes. The entire joint in each corner is made with only one electrode. The time to complete the weld is approximately 90 seconds. The room is well ventilated and the operator welds while seated.

A close-up of the joint is shown in Fig. 2. Bead appearance is relatively uniform and the type of electrode used leaves very little slag on the weld. Practically no spatter is encountered on this type of joint. Welds are dense, ductile and free of pin holes and have a minimum of build-up. After the welding operation, the casket is removed from the fixture and all corners are rough ground.

Following grinding, the next operation is inserting nailing strips required in attaching the velvet lining to the interior. Workmen then polish, sand and metal finish caskets preliminary to receiving a fine primer coat of paint.

After the primer is applied, the casket is then conveyed into an oven where it is baked for 2 hours. It then receives a dry sanding and what is called a color coat. This color coat may be a blend or a solid color and is permitted to air dry. After complete drying, which is rather rapid, all caskets are finished with a clear lacquer in a completely air-conditioned room. All impurities in the air that might mar the finish are thus eliminated. The caskets air dry for 4 or 5 hours in this same room and are then polished to a high luster with sheepskin wheels. Final polishing is done by hand.

Applications Featured At Metal Powder Show

Unique principles of the magnetic fluid clutch will be demonstrated on operating models exhibited by the National Bureau of Standards at the metal powder show in Chicago on April 5-6. The models, action of which depends upon the cohesive force of iron powder particles suspended in oil when subjected to magnetic forces, will show some of the unusual applications for the invention, including its use as a simple magnetic valve, shock absorber and as a special molding material.

Nearly every accomplishment of the expanding powder metallurgy industry will be represented by at least one exhibitor, it is said. Parts fabricators, press and furnace manufacturers, powder producers and powder handling and testing equipment makers will be exhibiting. Fabricators of parts made from metal powders will display specimens of their products including leaded iron bearings, copper-lead steel-backed bearings, clutch facings, brake linings, and other interesting applications.

Sponsored by the Metal Powder Association of New York, the show includes admission-free exhibits and technical sessions at which papers of interest to all segments of the indutry will be presented by leading authorities in their respective fields. Among the topics to be covered at the technical sessions are: Tolerances of metal powder parts, selling parts made from metal powders, and the problems of designing for powder metallurgy. Effects of impurities in metal powders and the effect of oxygen on the performance of iron powder will also be covered along with hygiene in the metal powder industry.

Among the displays of manufacturers of powder metallurgy equipment will be an operating powder metal press turning out small gears. Models of powder blenders and other powder handling equipment will demonstrate the operation of the type of machinery. It is stated that all of the major producers of metal powders for use in powder metallurgy will display their latest products ranging from aluminum powder to zinc powder and covering a great variety of metals and alloys. Several varieties of special magnetic powders will also be on display.

—o—

Three sizes of type M tube, for use in waste, soil, and vent lines and ¼-inch type L tube have been added to the revision of the Simplified Practice Recommendation for copper water tube and copper and brass pipe. Now approved for promulgation, according to the National Bureau of Standards, Washington, a revision bears the serial number R217-49 and is effective from Feb. 1, 1949. A 12-foot straight length of tube also has been added and the scope of the recommendation has been broadened to include recommended uses for the three types of tube covered, as well as dimensional tolerances.

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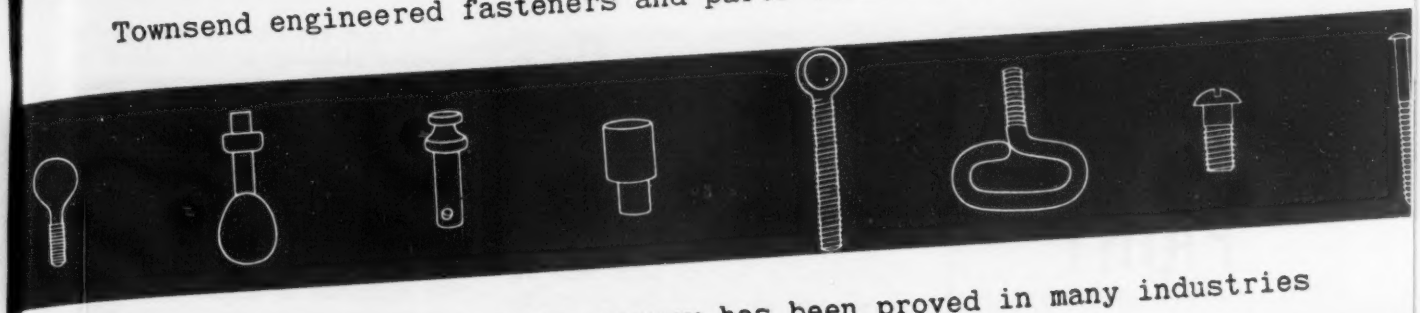

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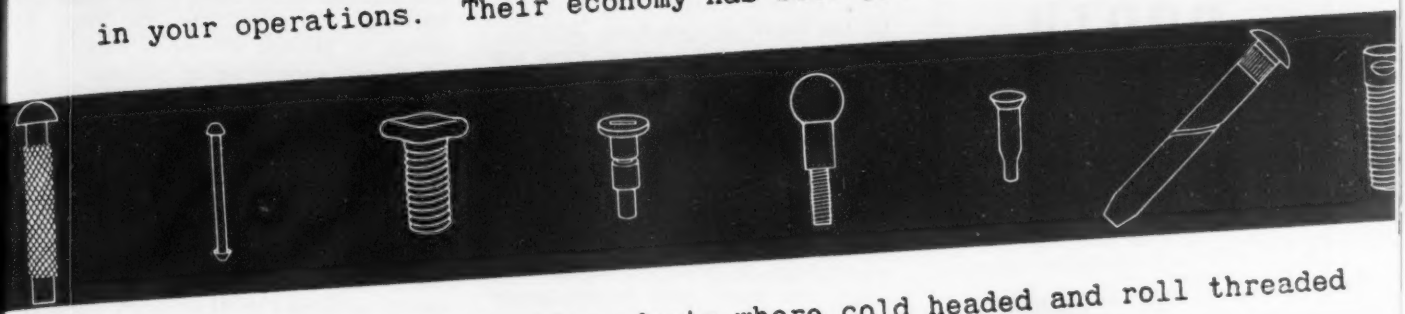

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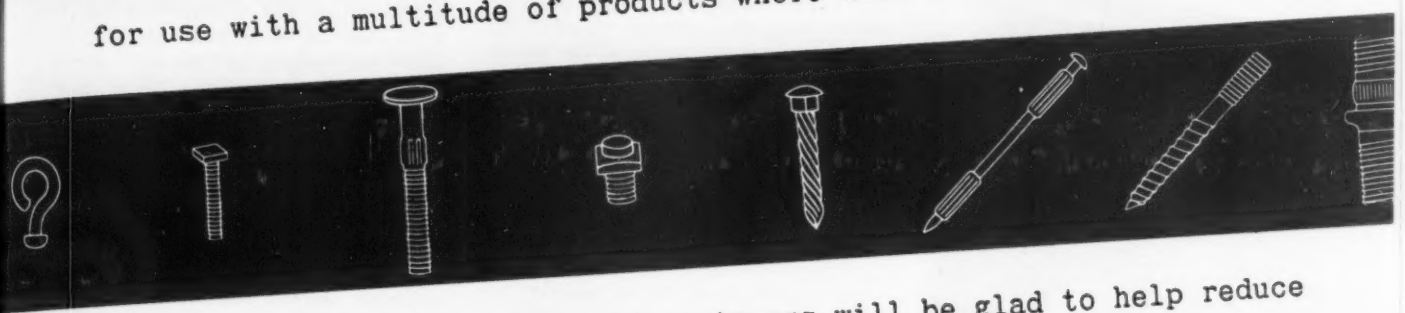

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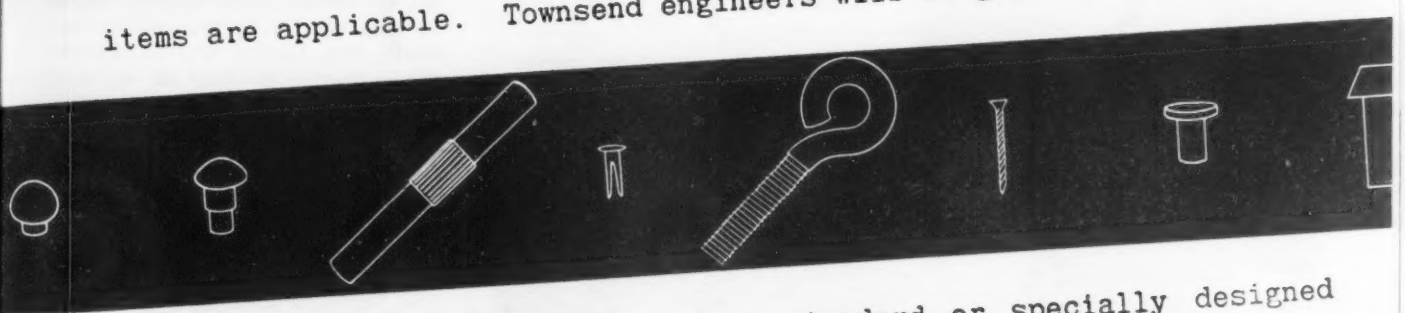

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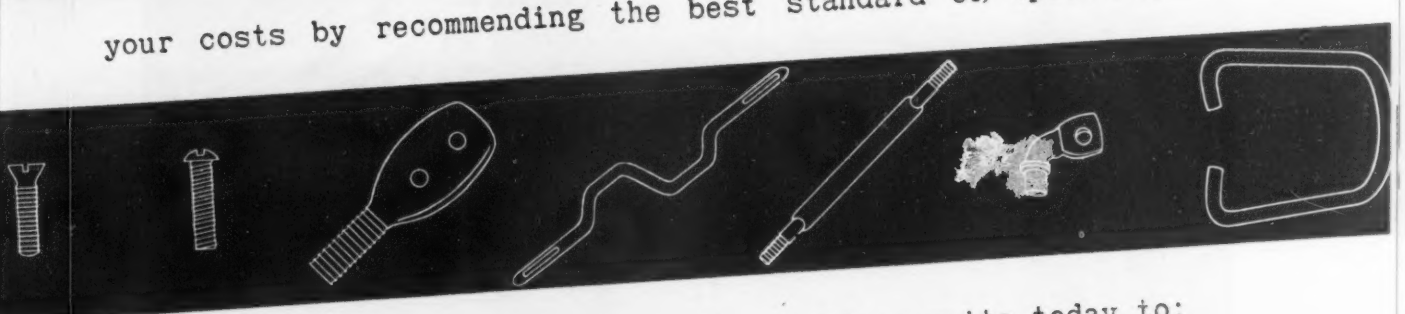

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Automatic PAINT BOOTH

. . . gives steel barrel manufacturer "pushbutton" operating advantages

MANY operating advantages and greater ease of maintenance are offered by a new automatic paint booth installed in the plant of Boyle Mfg. Div., U. S. Steel Products Co., Alameda, Calif., for painting steel barrels produced by this U. S. Steel Corp. subsidiary.

In planning the new booth the first consideration was to paint with the barrel axis parallel to the water curtain. In this manner, the flat ends on the barrel are lined up "directly" with the air flow; spray guns are accessible and, at the same time, do not become built up with their own offspray. It was, of course, very desirable to extend the water tank beneath the spinner and guns to receive drips and offspray.

As the production line makes a right angle turn to go through the oven, the booth had to be turned around and centered facing the predryer, test tank, seamer etc. Barrels are painted in the mouth of the booth. When the spraying operation is completed an up-ender drops down and the barrel is transferred to it, up and out and lowered to the conveyor which feeds the barrel on its end to the oven.

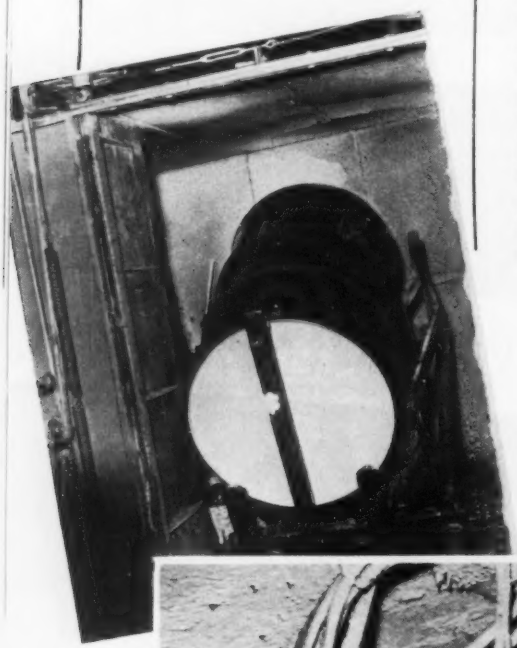


Fig. 1 *(below)—Painted steel barrel in position on spinner, ready to be transferred to the up-ender*

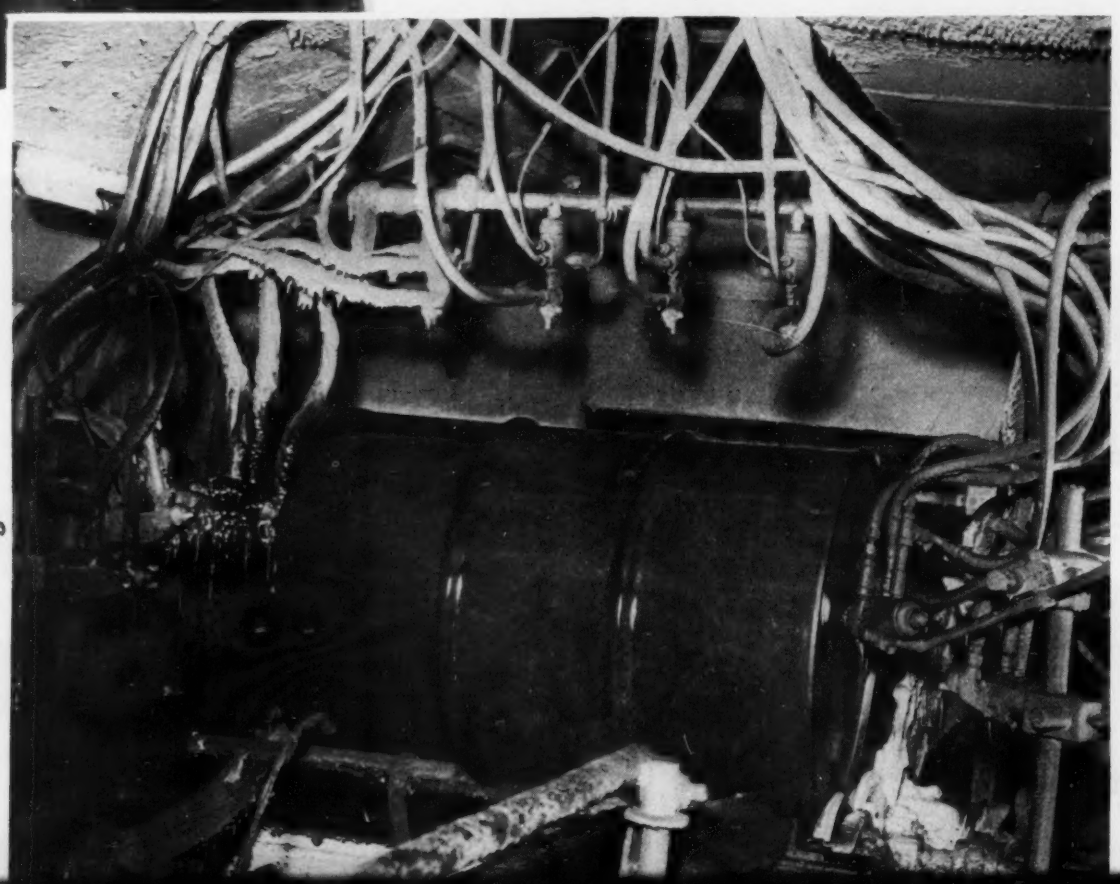
Fig. 2 *(left)—Up-ender raising a painted barrel to vertical position before placing it on conveyor leading to the drying oven*

The guns are all accessible to the operator standing at the mouth of the booth. No offspray can reach him while making spray adjustments. All operating machinery is outside the booth. Lighting is by vapor-proof flood lights just outside the mouth of the booth. The oven conveyor is equipped with angle-iron cross bars to carry the barrels on end. All control equipment is located in the central position to the right of the booth opening. All operations are interlocked to prevent erroneous jogging of manual control set-up buttons.

Barrels coming from the predryer are at too low an elevation to be fed to the paint booth. To correct this, a motor-driven elevating conveyor was built to raise and progress barrels. It comprises a steel angle frame with pintle chains running up hill in 4-inch channels and suspended between sprockets on the return. Each eleventh link has a projecting lug to drive barrels. Side rails are adjustable for length of barrels, which travel up the conveyor with their axes at right angles to the line of progress. The unit is roller-chain driven by a motor reducer.

Next is the feeder unit, consisting of an angle frame equipped with limit switches, solenoid valves, and a double-acting, double-cushioned, air cylinder. Barrels roll on their double seams down 3-inch angles, to be stopped by an escapement rocker. When two barrels are in position, the conveyor is shut off by limit switches. At the proper time, the

(Please turn to Page 98)



Effective Motions—*Concluded from Page 70*

to the airport and the 1-hour ride from the Detroit terminal to the city are handling time. If machining is stepped-up 25 per cent, a net saving of 10 minutes is achieved. But if the handling period is reduced by 25 per cent, the saving jumps to 22-½ minutes.

Obvious Advantages — Machine builders and the metalworking industry have been quick to appreciate the potential advantages of multiple-station tools equipped with material handling devices. Various ingenious methods of transporting parts of all kinds have been designed. Their use is not confined to high-speed manufacturing, nor to small parts only. Machines can be created to operate at almost any rate of production and, within reasonable limits, to handle practically any size part.

In fact, large and hard-to-handle pieces offer perhaps the best opportunity for cost reduction in machining. Two general types of automatic transfer mechanisms, or Transfermatics, as we call them at the Cross Co., have been developed for such pieces and can be employed on any reasonable number of properly arranged machines.

The first type of mechanism for moving large parts between stations is one that descends from above, picks up the work pieces, carries them forward to the next operation, lowers them into position and returns through the same path for the next pickup. This type is illustrated in Fig. 1 which shows a unit designed for drilling, chamfering and tapping holes in both sides of the banjo face of heavy-duty truck axle housings. Production of 70 pieces per hour at 100 per cent efficiency is achieved with one unskilled operator.

The second type of transfer mechanism referred to above raises parts from below, moves them transversely, lowers them into position and returns beneath the machine. Fig. 2 illustrates this type used in finishing transmission joint faces square with the crankshaft bore on V-8 engine blocks, at the rate of 56 pieces per hour at 100 per cent efficiency with one operator. Fig. 3 shows the same type of transfer mechanism on a line of five machines on which two operators finish automobile rear axle housings at a production rate of 150 per hour at 100 per cent efficiency.

In these units, the transfer mechanism is used only to carry the work from one station to the next and has nothing whatever to do with locating or clamping. Each machine tool is an independent unit equipped with its own holding fixture exactly the same as on equipment serviced by hand.

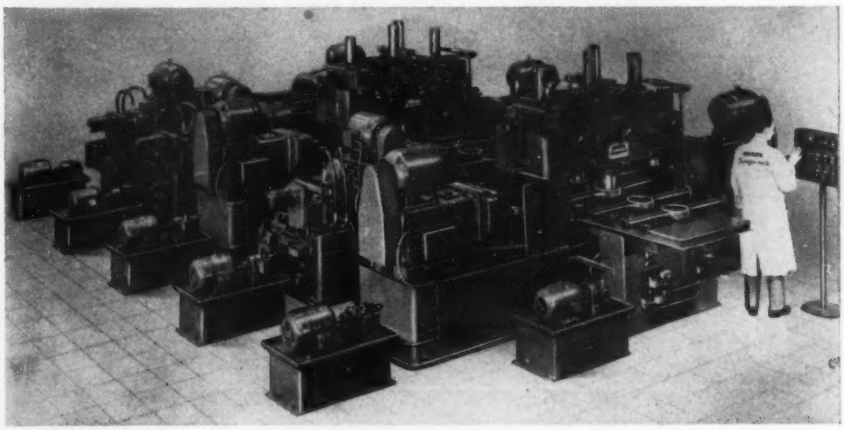
Cuts Labor Overhead—The fact that direct labor is drastically reduced by the use of transfer mechanisms necessitates a re-appraisal of the present almost universal method of charging burden as a percentage of direct labor. When one or two operators replace a number of men, indirect labor appears large by comparison and, in some cases, even exceeds the cost of machining.

Undoubtedly, the machine tool of tomorrow will provide automatic inspection, will lower sharpening time of cutting tools, and will reduce other indirect labor requirements.

Until such improvements are practical, however, a multiple-station machine with one or two operators requires virtually as much indirect labor as several machines with individual operators. Cutting tools must be examined, adjusted and changed. In most cases, it is necessary to preset tools to gages so they can be changed with little or no time lost for setup. Provision must be made for inspection of finished products. Finally, at regular intervals chips must be removed, equipment cleaned and lubricated and electrical, hydraulic and mechanical parts kept in good condition.

The break-even point at which it becomes economical to utilize transfer-type mechanisms can be determined only by careful study of each individual situation. In most instances, however, the possibility exists for increasing productivity with fewer man-hours. This opportunity suggests a promising future for automatic, multiple-station, special machine tools utilizing transfer mechanisms.

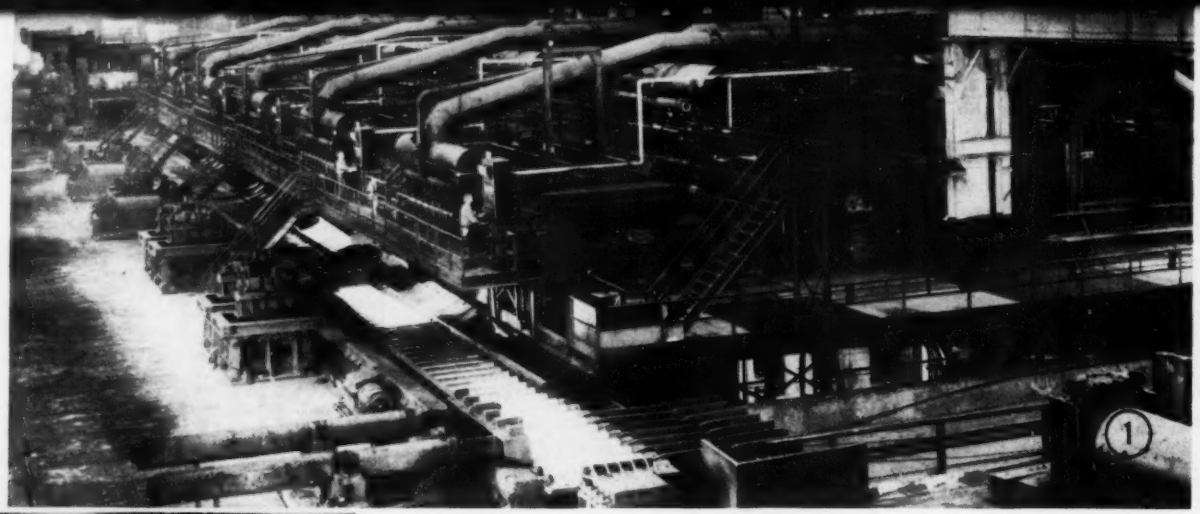
Fig. 3—Transfer mechanism installed on a line of five machines on which two operators finish automobile rear axle housings at a production rate of 150 per hour

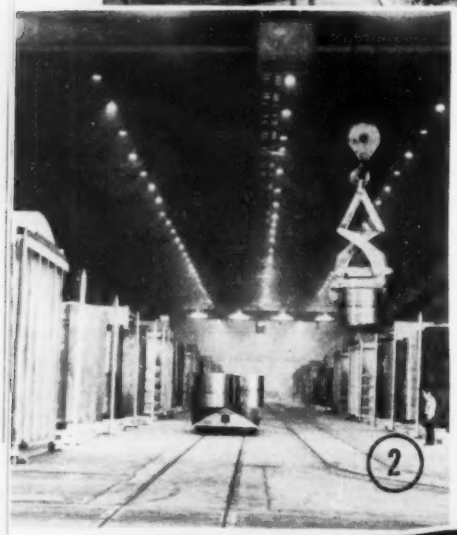


Machine Broaches Hole In Forged Steel Links

Simple, yet unique tools and fixtures applied to a single ram horizontal machine are employed in the finishing of two punched holes in five sizes of forged steel links used in coal mining operations. The cutter chain links, made in right and left hand styles, are broached on a type XL-20 machine, built by the Oilgear Co., Milwaukee. In the first operation, holes up to 1.500-inch in diameter are broached in one pass and about 0.140-inch of stock is removed from the diameter. Production is said to be 170 links per hour. The finished face of the link rests against a reducing bushing fixture and tool is guided by a roller type broach support.

After broaching the first hole, a fixture is installed on the same machine and the second punched hole is finished to a close center tolerance with a Roto-Kut tool. The previously broached hole is located over a plug and a sliding clamp on the front of the fixture holds the part to a locating face on the fixture. The fixture maintains parallelism of the two holes and keeps axis of holes square with the finished surface on the link. Approximately 0.130-inch of stock is removed from holes up to 1.237-inch in diameter. Production is 140 links per hour on this second operation.





New Facilities at Gary Sheet and Tin Mill Offer

. . . INCREASED TIN PLATE CAPACITY

CAPACITY for production of cold-reduced tin plate and sheet steel is being increased at Gary Sheet and Tin Mill of Carnegie-Illinois Steel Corp. by the extensive additions of new equipment and revision and replacement of existing facilities. Completion of the program will augment plant capacity by increasing yields, boosting operating speeds, by providing better handling methods.

Yields will be further increased by adopting the use of much heavier coils for processing than used formerly. These are obtained by welding smaller coils end to end to form long, continuous lengths required for

(*Please turn to Page* 103)

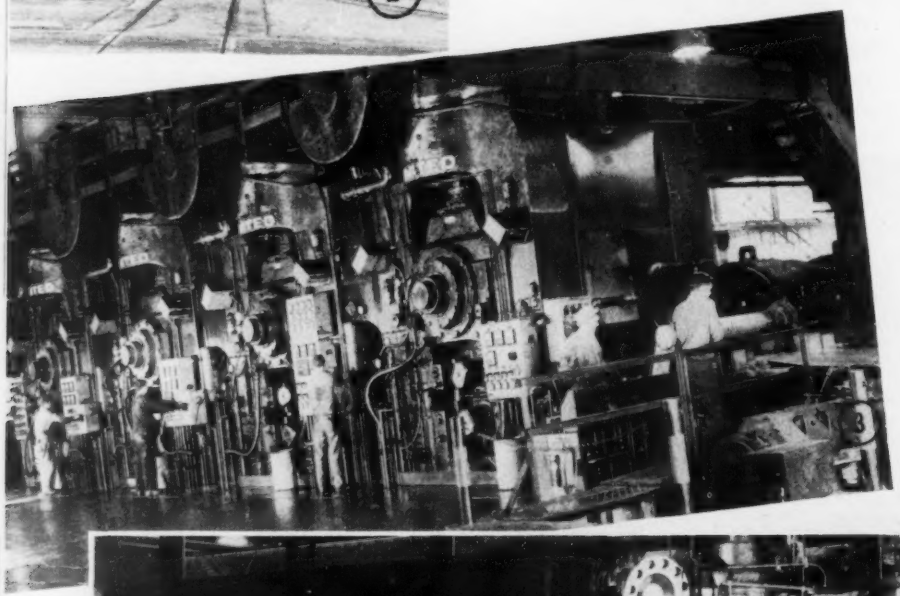
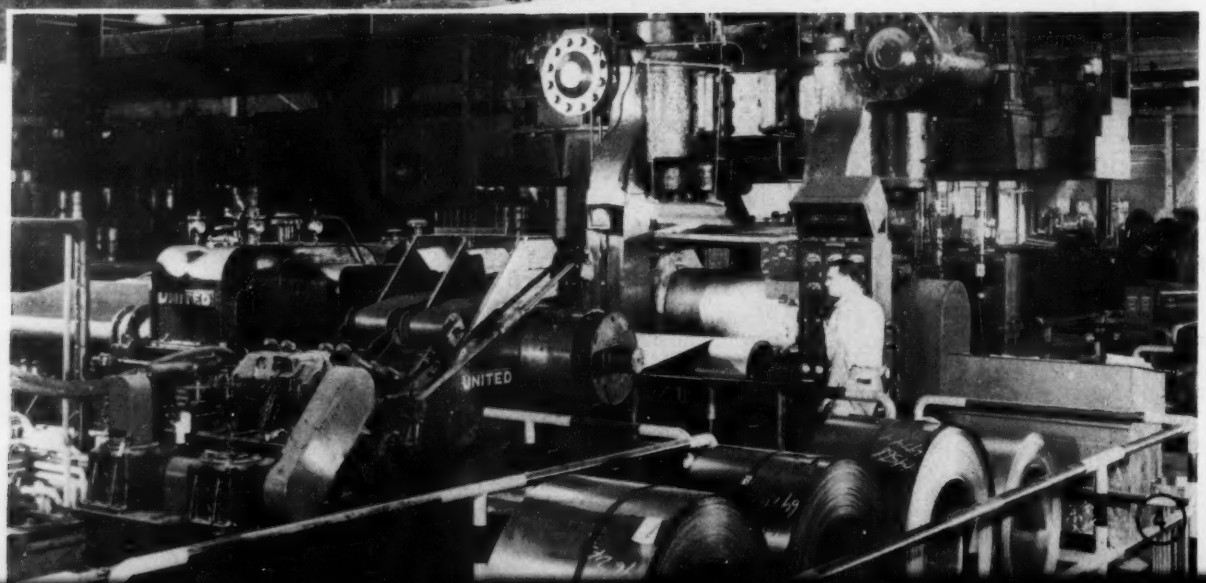


Fig. 1—*Slab heating furnaces and* 80-*inch hot-strip mill which they serve*

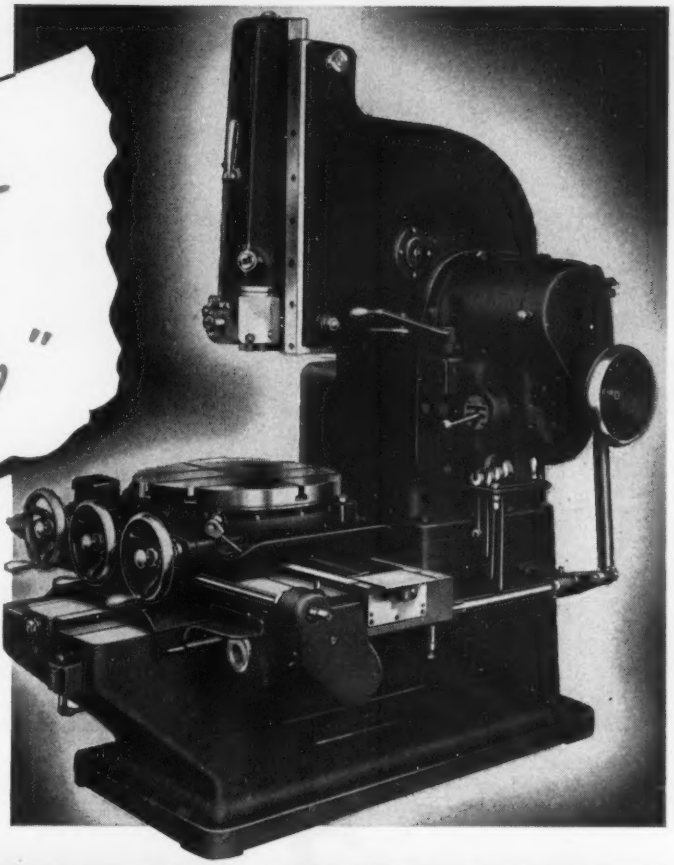
Fig. 2—*General view of an aisle in the sheet mill annealing department where sixteen new coil-annealing furnaces were installed*

Fig. 3—*This* 54-*inch* 4-*stand tandem cold-reduction mill is capable of operating up to speeds of* 3000 *fpm*

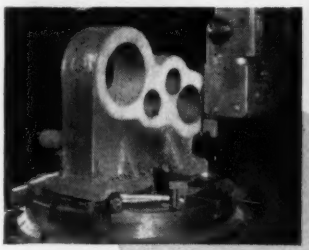
Fig. 4—*New high speed temper mill will add to capacity of three other units which were rebuilt and relocated*



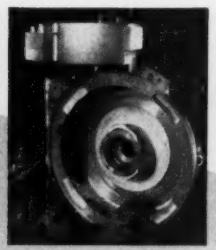
"the handiest Machine in the shop"



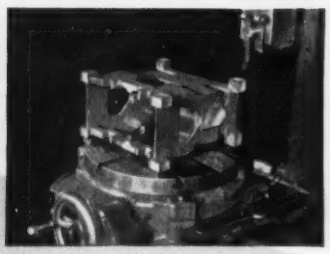
The machining of irregular shaped work can be expensive when set up on equipment with inherent limitations. Such work calls for the P&W Vertical Shaper — the machine that's in a class by itself for range of profitable application in the toolroom and in the die shop. For example . . .



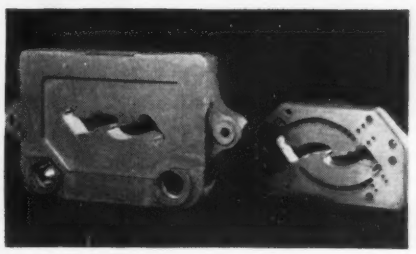
Large casting faced on both sides — without change in setup and without need for a special fixture.



Three cylindrical surfaces machined to specifications, again without costly fixture.



All 35 slots and surfaces on both sides of this irregular-shaped box jig were machined without a change in setup.



Other methods required as much as 43 hours to machine the irregular contours of this die and die shoe. P&W Vertical Shaper finished the job in 8¼ hours.

This Bulletin describes the 6 inch and the 12 inch (illustrated) P&W Vertical Shaper's features for the profitable machining of all sorts of irregular-shaped work. It's yours for the asking — without obligation.

These illustrations are typical of the variety of work accomplished with characteristic Pratt & Whitney accuracy on the Vertical Shaper. Hard-to-reach surfaces, intricate shapes, odd bosses and slots, relief angles for dies — all are easily reached by the cutting tool, and are usually *machined without special fixtures or change of setup.*

The operator likes this machine because it simplifies his work; he finds the ordinarily difficult jobs easy to mount, to index, to observe, to control. Management likes it because it pays off in time-saving, accurate results. Without question, it's "the handiest machine in the shop."

Pratt & Whitney

Division Niles-Bement-Pond Company
WEST HARTFORD 1, CONNECTICUT

Vertical Shapers

Fig. 1—Overall view of rotary hearth furnace for heating billets preparatory to piercing. Streak of light, lower right, caused by heated billet passing over transfer table. Charging machine is shown at left

Fig. 2—Rotating circular disk is indexed with furnace hearth to tabulate kinds of material being heated and to determine their relative locations on the circular hearth. Insignia on periphery indicates relative length of each zone

5 ZONE ROTARY FURNACE

Employed To Heat Billets for Piercing

New doughnut-type unit is rated at 50 tons per hour when heating sections 8 inches diameter and 16 feet long to 2350° F. Maximum fuel input when burning either coke oven gas, fuel oil or natural gas is 1¼ million Btu an hour. Automatic charging is employed

STEEL billets for piercing now are being heated in a doughnut-type rotary-hearth furnace at the No. 2 seamless tube mill of the National Tube Co., Gary, Ind. It is the first furnace of its type in the industry incorporating five separate walled or baffled zones of temperature and furnace pressure control with individual stack from each zone, as compared to the three zones normally used. Along with improved tube-handling equipment at the mill, and a new, continuous, tube-reheating furnace, the new rotary furnace at this plant renders the No. 2 mill better equipped for the production of high-quality specialty tubing, which is made in a large variety of sizes of precise dimensions in varying grades of carbon, alloy and stainless steels. The mill turns out tubes from 3 to 9 inches outside diameter and up to 45 feet long.

The Gary plant specializes in mechanical and pressure tubing, such as used extensively in dairy plants, chemical plants, all kinds of aircraft, ball and roller bearing races, industrial conveyor rolls, refinery-still tubes, and other products.

Facilities of the rebuilt mill, which turned out tubing for Navy rockets, military aircraft and lend-lease during the war, have been undergoing reconstruction and modernization since late in 1947. The completed work is the first long step in National Tube's program to improve and expand its facilities at Gary for the manufacture of specialty tubing. Other new facilities under construction or definitely planned at Gary include another seamless tube mill of a different and even more advanced type.

Furnace Capacity—Capacity of the

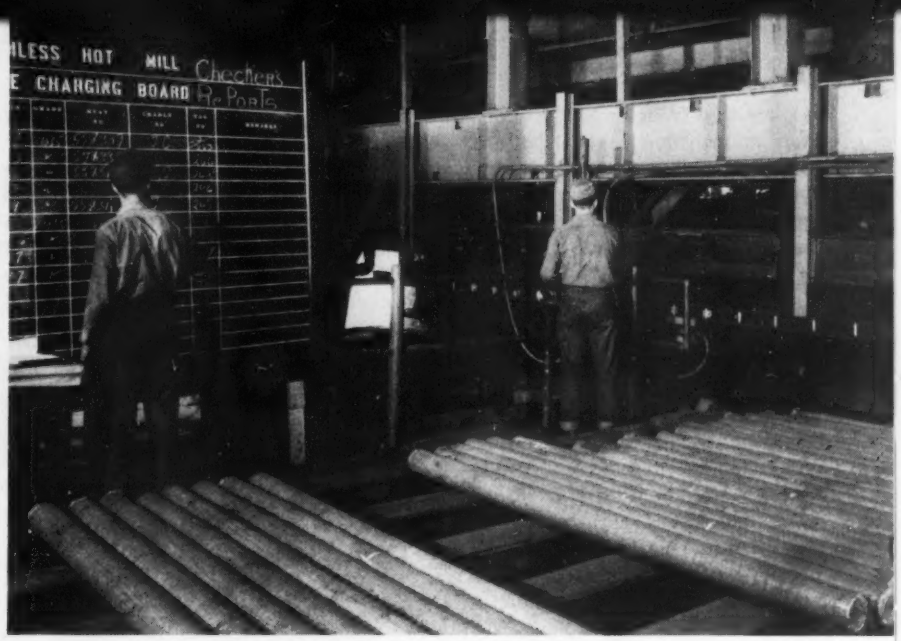


Fig. 3—Feed table for charging machine which loads billets into heating furnace hearth

new furnace is 50 tons per hour of 8-inch diameter by 16-foot long billets, heated from room temperature to a maximum temperature of 2300° F. Maximum furnace operating temperature is 2350°F. The range of billet sizes that can be heated is from 3 to 8 inches, inclusive, in diameter, and 3½ to 16 feet in length. Hearth width of the furnace is 18 feet. Heating chamber width between walls is 19 feet, and its height inside the furnace is 5 feet, 6 inches. The centerline diameter of the hearth is 42 feet. Diameter of the steel shell of the inner wall is 19 feet, 10½ inches; for the outer wall, 64 feet, 1½ inches. Overall diameter (over the buckstays) is 65 feet, 9½ inches.

Furnace Construction—The lining is first-quality firebrick, 13½ inches thick, built up of 9 x 4½ x 2-inch brick. The firebrick lining is backed up with 5 inches of insulating block and granules. A steel-plate shell, ¼-inch thick, welded to the buckstays that are 10-inch wide-flange beams, retains and protects the outside wall of the furnace.

The inside wall is retained by tie castings located every 18 inches of the inner shell diameter, and at three elevations, with the first starting at approximately hearth level. The flat, suspended-type arch, 9 inches thick, was built of first-quality firebrick, backed up with ½-inch of insulating concrete covered with 2 inches of block insulation. The arch is suspended from 14-inch wide flange beams. Billets are supported 2 inches above the hearth proper on 14 concentric piers, 4½ inches wide, built of high-alumina firebrick. The refractories of the hearth consist of a layer of high-alumina firebrick, 4½ inches thick, underlain by 7½ inches of first quality firebrick, over a total of 7½ inches of insulating material.

The steel structure constituting the main hearth frame is made of 8-inch wide flange beams. This frame is made in 24 welded sections, and the sections are bolted together to form a solid ring. Wheels and driving rack are mounted on the underside of the beams.

So that expansion and contraction of the refractories will not be transmitted into the main hearth frame, 24 arcuate sections of 15 angular degrees each of secondary framing, fabricated from 6-inch channels and covered with ⅜-inch steel plates, rest upon the main hearth frame. These secondary frame sections are not fastened to the main hearth frame, but merely rest upon it and are held in place by lugs.

The refractory hearth is built upon the ⅜-inch plate of the secondary framing and retained by curved castings of 2 per cent chromium iron.

The hearth rotates on 72 wheels, located radially, 24 radial rows of 3 wheels each (3 wheels across the hearth width). The wheels are 12 inches diameter with a 5-inch face, and equipped with 2 tapered roller bearings. Capacity per wheel is 15,000 pounds.

Centering of the hearth is maintained by 18 spring-loaded cast-iron rollers located under the inner wall. They engage a ¼-inch thick hardened-steel wearing strip welded on a 12-inch channel, which is part of the main hearth frame. The rollers are 6 inches diameter with a 3½-inch face, 4 inches long over the hubs. Pins are 2 inches diameter. The outboard bearing is a journal roller bearing with inner and outer race, equipped with 5/16-inch diameter rollers, 4 inches long.

Hearth-supporting wheels run on a 60-pound rail, mounted on 8-inch wide flange beams. These beams frame in with other 8-inch wide flange beams that tie between furnace buckstays. This constitutes the under framing that rests upon the foundation.

Both inner and outer water seals are made of mild steel and are of the double-lip type. The steel water trough does not rotate with the hearth. All sealing lips and the inside of the water trough are coated with a water-resistant paint. The water troughs are made in sections approximately 15 feet long to facilitate inspection.

Inlet water flows in the trough to the next inlet location where it is discharged through a weir in the

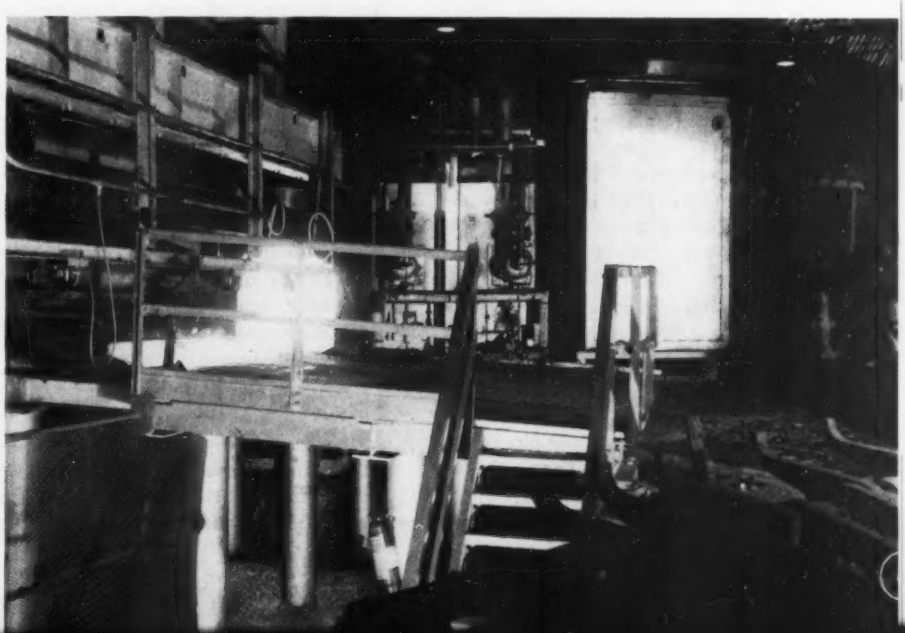


Fig. 4—Discharging machine at left removes heated billets through open discharge door

side of the trough. A visual pipe drain is provided at each discharge point. Flow of water to each seal trough is controlled from the water temperature in the trough by a thermostatic valve.

Zones and Baffles — The furnace chamber is divided into five zones. Starting at the centerline between the charge and discharge zones, zones 1 to 3 each comprise a 90-degree angular sweep of the hearth and zones 4 and 5, 45 degrees. Five baffles, 13½ inches thick, constructed of hard-burned, superduty firebrick, interlocking tile separate the zones. These baffles are suspended from 21-inch wide-flange beams. Clearance between the hearth and the baffles is 11 inches when the baffles and hearth are cold, and 10 inches when the furnace is heated to operating temperature.

Hearth Drive—Continuous rotation of the hearth for single-row billet loading, or intermittent operation for multiple-row billet loading, is possible. Power to rotate the hearth is transmitted by a 15-horsepower direct current motor of the general purpose type, totally enclosed and fan-cooled, with a 4:1 speed range. The motor is located near a central point and the pinions engage the hearth rack 180 degrees apart. The differential is designed for a 668-foot-pound torque. The lineshafts from the differential are each 2-7/16 inches diameter. Each lineshaft drives a speed reducer through V-belts. Output pinion shafts of the speed reducers are 5 inches diameter, and carry pinions with 7½-inch face, 12-inch pitch diameter and 12 teeth. A circular rack in sections of approximately 5-foot lengths is bolted to the hearth main frame. This rack is engaged by the pinions to drive the hearths. A tachometer records hearth speed in feet per minute, and is mounted on the instrument panel.

A 6-foot diameter dial that rotates at hearth speed is provided for the furnace operator to record all orders of billets as they are charged, showing the location of all billet orders in the furnace. Cast iron charge and discharge doors are counter-weighted and operate through motor drives electrically interlocked with the charging and discharging machines. Cast-iron inspection doors in the outer wall for zones 2, 3, and 4, have openings 2 x 2 feet high. Three post hoists of 1500-pound capacity each are supplied for manual operation of the inspection doors. In addition, five inspection holes, one in each zone at hearth level, are provided for observation and temperature checking.

Burners and Fuel Capacity—Forty-three burners of the long flame luminous type, 16 on the inner wall and 27 on the outer wall, supply heat to the furnace, and may burn coke-oven gas, natural gas, or bunker-C fuel oil. Each burner has a natural-gas pilot, oil valve, oil shut-off valve, V-port limiting orifice and lubricated, plug-type, shut-off cocks. Primary air is supplied to the burners in each of the five zones by individual blowers at 8 ounces pressure. The atomization air when burning fuel oil is taken from the discharge side of the primary air blower, by individual atomizing blowers for each zone and discharged at 18 ounces pressure, thus insuring 16 ounces pressure at the burners for the purpose of atomizing the oil.

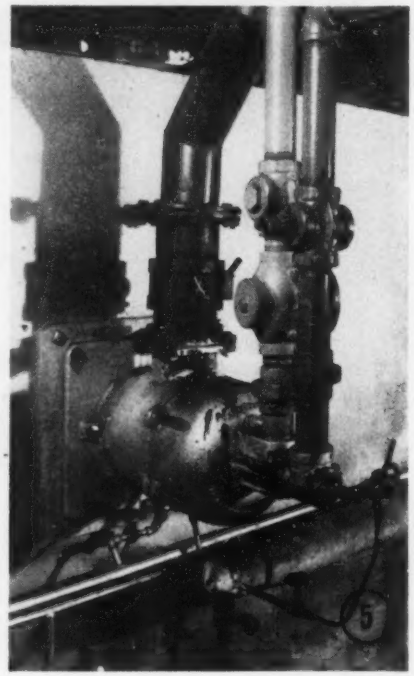


Fig. 5—Closeup of burners on exterior wall of furnace

Four burner access platforms of open subway grating 60 inches wide, with hand railings extending between flue offtakes were built for the outer wall. Each outer wall platform is provided with a stairway. For the inner wall, practically the entire hole of the doughnut section is covered with open grating, a stairway provides access to the platform from under the furnace.

The furnace foundation and main supporting members were arranged and built to provide ample headroom under the furnace for maintenance and permitting the doughnut or center section to act as a stack causing the air undernearth the furnace to circulate freely.

Maximum fuel input, when burning any of the three fuels mentioned above, is 125,000,000 Btu per hour. The fuel rate for heating 8-inch diameter by 16-foot long billets in continuous operation, is 1,900,000 Btu per ton, using any one of the three fuels.

The distribution of fuel supply to the furnace is shown in Table I. The oil conditioning and circulating system is similar to a closed system, the excess or unburned oil keeps circulating within the system around the furnace, with the required makeup oil from the main oil supply line, eliminating the need for any surge or storage tank. The system includes two oil circulating pumps (one for standby) of 40 gallons per minute capacity at a pressure of 30 psi, maintained by a relief valve in the return line adjacent to the pump suction. Other equipment includes an oil mill of 1000 gallons per hour capacity, and a line heater equipped with a thermostatic temperature control that can maintain oil temperature at approximately 200°F at the burners. Oil and steam tracer lines were provided with insulating pipe covering.

Gas-Pressure Regulators — These provide control of gas pressure in the main gas-supply line. The regulator is of the standard, single-diaphragm type, mounted upon a steel-frame panel. A pressure-adjusting setter was provided on the panel. The regulator actuates a hydraulic cylinder that operates a butterfly valve in the main fuel-supply line.

Combustion-Air Blowers — Burners for each zone are supplied with air for combustion by two blowers of the 4-bearing type, V-belt driven with a maximum operating speed of 1450 rpm. One blower supplies main combustion air for all fuels. The other auxiliary blower supplies air for atomization when burning fuel oil. Each of the five main-combustion blowers is equipped with an air filter. A pressure switch connected to the inlet of each auxiliary blower will stop the blower motor if failure of the main combustion-air blower occurs. The complete list of blowers for the furnace is presented in Table II.

Air, Gas, Oil and Steam Piping—General fabrication of the air piping is of welded 16-gage sheet construction, with ½-inch thick flanges of the 25-pound American standard type, sized for maximum velocities of approximately 40 feet per second. Gas piping consists of standard pipe and fittings, sized for maximum velocities of approximately 50 feet per

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second. Oil lines are of 1-inch standard pipe size, with ⅜-inch burner offtakes. Paralleling the 1-inch oil line is a steam tracer line of 1-inch standard pipe. These pipes are insulated together in a common covering of 1½-inch thick insulation covered with canvas and treated with the standard finish for indoor service.

An integrating and recording fuel meter has been installed, with one orifice plate for metering natural gas, and a substitute orifice plate for use when metering coke-oven gas. This operates in conjunction with a recording and integrating oil-flow meter with orifice pipe that is used when oil is the fuel.

Safety Shut-Off Valves—A solenoid operated, 10-inch duplex, automatic, safety shut-off valve, has been provided in the coke-oven and natural-gas supply line. There is also a solenoid operated, 2-inch duplex, automatic, safety shut-off valve for the fuel-oil supply line. Power failure, gas-pressure failure, oil-pressure failure, or failure of any blower, closes the valves which must then be reopened manually. Pressure switches connected in series are located as follows: One in each main combustion-air blower inlet (total of five), also used for auxiliary blower protection; one in the gas supply line for coke-oven or natural gas, and one in the oil-supply line.

Fuel-Air Ratio Control — This equipment includes a separate combustion regulator, butterfly gas-control valves; cylinders to operate the butterfly valves for natural or coke-oven gas; natural-gas orifice plates; coke-oven-gas orifice plates; adjustable port oil valves; cylinders to operate the oil valves; meters with transometers; hydraulic transfer valves; impulse transfer valves; manual-automatic valves; and 2-pointer, 4-scale, flow indicators for air, natural gas, coke-oven gas, and fuel oil —a complete set for each of the five zones. Mounting of all this equipment is on steel panels.

Automatic Furnace-Pressure Control — Pressure inside the furnace chamber is maintained automatically at a point slightly above atmospheric pressure by regulators, one of which is provided for each zone. The regulators control the positions of water-cooled, flap-type dampers in each of five offtake flues. The automatic furnace-pressure-control system comprises five single-diaphragm-type furnace regulators; hydraulic damper-operating cylinders, with linkages to operate the five dampers; and furnace-pressure recording gages. The regulators are mounted on steel-frame panels upon which the furnace-pressure recorders are flush mounted. Each regulator is provided with a setting indicator and a manual-automatic valve. An oil pump of 22.4 gallons per minute capacity at 80-pound working pressure supplies oil to the operating cylinders of the furnace-pressure control unit, and also to the natural and coke-oven gas pressure control, and combustion control.

Temperature Control — Each zone is equipped with a single-point indicating and recording controller. Operating range of these controllers is 1200 to 2600°F. Also provided for each zone is an automatic droop-corrector, and valve-drive mechanisms. Radiation-type sensing-element assemblies are provided with cooling jackets and 30-inch, closed-end, silicon-carbide target tubes; also safety shutters and safety switches. The control panels are enclosed in a steel frame and a steel-covered enclosure, 18 x 37 x 8½ feet, with a door at each end, steel-sash windows, and air-filtering and circulating unit. A fan delivers 3140 cfm through a filter to pressurize the interior of the control house and prevent air infiltration.

Charging and Discharging Machines — Operation of the charging machine is entirely automatic. It consists of a peel supported upon an overhead carriage. A self-contained hydraulic system actuates the motions of the peel. The peel is maintained in a horizontal plane and is raised and lowered by double bell cranks operated by a hydraulic cylinder. The tong grips on the peel are operated by a hydraulic cylinder. The carriage is supported upon four heavy, cast-steel wheels driven through speed reducers by an electric drive unit. The peel is internally water-cooled and a flexible connection is provided for water supply with a visible-type drain outlet.

The discharging machine is manually operated from an enclosed control pulpit, located on the mill floor between the two machines, and enclosed with provision for rotation about a vertical shaft to allow motion along the base of the hearth. The charging machine operates at a maximum of 240 cycles per hour, while the discharging machine can operate at a maximum of 360 cycles per hour. Maximum weight of billet handled is approximately 2735 pounds.

A unit hydraulic system, consisting of pump, storage tank, pressure and relief valves, strainers, solenoid-operated control valves, and so on, is mounted upon the carriage of each of the machines. Each machine also is provided with a sturdy structural-steel supporting framework with standard rail-section tracks for the travel of the carriages.

The furnace drive, wheels, door-operating mechanisms, and handling machines are provided with pressure-type lubricating systems. One system was installed upon the hearth frame, with connections for all hearth-supporting wheel bearings. The compressor is of the manually-operated type. A manually-operated system lubricates the hearth-drive shaft and bearings, and the charge and discharge door-operating mechanisms. The charge and discharge machines are each provided with a manually-operated system for lubrication of carriage wheels and all peel mechanism bearings.

Electrical Equipment—All motors are 220-v, 3-phase, 25-cycle, 1450 rpm, totally-enclosed fan-cooled ac units with antifriction bearings, except the totally-enclosed and fan-cooled 230-volt dc motor with antifriction bearings that drives the hearth. Horsepower ratings of the electric motors required for operation of the new furnace are given in Table III.

The hydraulic pump for the charg-

TABLE I

DISTRIBUTION OF FUEL SUPPLY

Zone No.	Zone Angularity, degrees	Burners No.	Burners Size, inches	Natural gas, cu ft/hr
1	90	10	8	32,000
2	90	11	8	35,200
3	90	11	8	35,200
4	45	6	6	13,200
5	45	5	8	16,000
Total	360	43		131,600

TABLE II

DATA ON FURNACE BLOWERS

Zone No.	Primary Combustion Blowers: Capacity, cfm	Pressure, oz	Horsepower
1	7700	8	30
2	7700	8	30
3	7700	8	30
4	3850	8	15
5	3850	8	15
	(Oil Atomizing Blowers)		
1	1600	10	7½
2	1600	10	7½
3	1600	10	7½
4	1000	10	5
5	1000	10	5

TABLE III

NUMBER AND RATINGS OF MOTORS

Application	Motors No.	Motors Hp
Primary combustion blowers	3	30
Primary combustion blowers	2	15
Oil atomizing blowers	3	7½
Oil atomizing blowers	2	5
Hearth drive (4:1 speed range)	1	15
Charge and discharge doors	2	3
Fuel oil mill	1	10
Fuel oil pumps	2	2
Furnace control oil pump	1	1½
Damper controls	5	1/3
Control house blower	1	1
Charging machine hydraulic pump	1	20
Charging machine drive	1	25
Discharging machine hyd. pump	1	20
Discharging machine drive	1	25
Discharging mach. control cab blower	1	1/3

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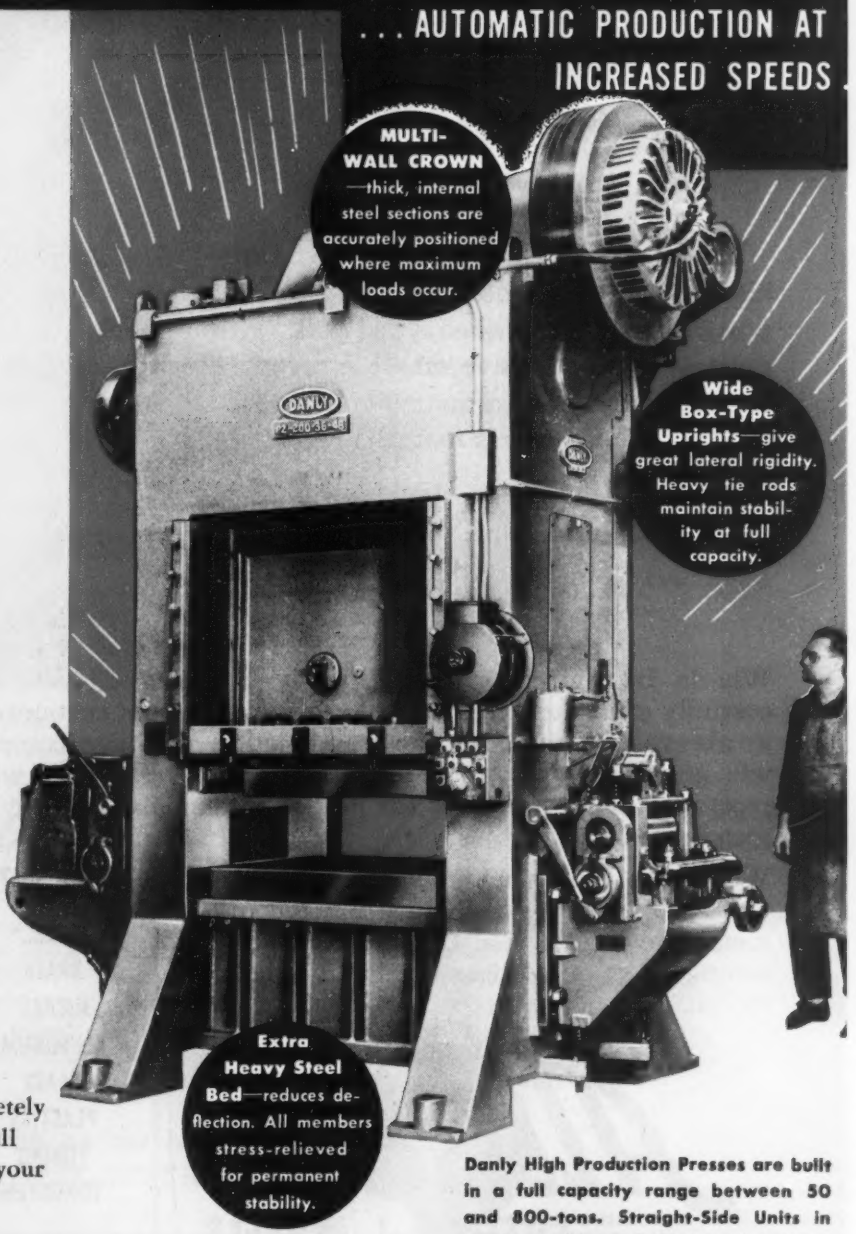
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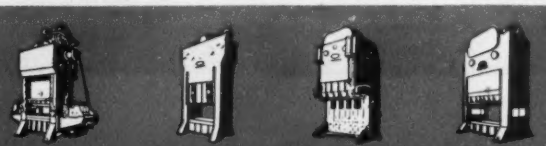

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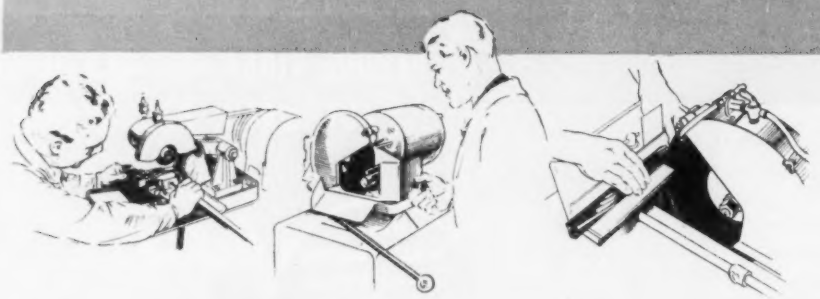
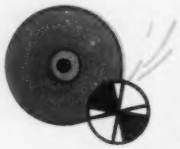


THE METHOD *Abrasive Cutting!* The high-speed, high-precision method that offers important cost-saving possibilities. Even when you work with the most difficult materials, the abrasive wheel slices or slits to size within a few thousandths, in a matter of seconds . . . leaves a finished surface . . . minimizes material waste.



THE WHEEL

Allison (*Rubber Bonded or Resinoid Bonded*) Cutting Wheels. In developing our wide range of wheels to solve successfully even the "impossible" problems so often encountered in abrasive cutting, the facts and figures we have compiled will go a long way toward helping us make specific wheel recommendations to meet the needs of your job . . . and will mean savings.

We suggest you send us samples of the work you're cutting so that we may recommend the *right wheel.* Or we will gladly arrange for an Allison Field Engineer to call.

DO YOU CUT

STEEL
BRASS
NICKEL
ALUMINUM
GLASS
PLASTICS
TUBING
TUNGSTEN

IF SO CALL AN *Allison*

ABRASIVE CUTTING EXPERT

Allison ABRASIVE CUTTING WHEELS

FREE ON REQUEST

Here are the complete facts on Abrasive Cutting and Allison Wheels . . . yours for the asking. Send for your copies today.

THE ALLISON COMPANY
255 Island Brook Ave., Bridgeport, Conn.

ing machine is a 20-hp ac motor. The drive for this machine is a 25-hp dc motor that has a 2:1 speed range. Hydraulic pump for the discharging machine is a 20-hp ac motor. Drive for the discharging machine is a 25-hp dc motor with a 2:1 speed range. This latter motor has forced ventilation with air filter, and is equipped with a temperature alarm in the field that sounds in case the temperature increases to dangerous limits. The control-cab blower is operated by a 1/3-hp ac motor.

Instrument Society Issues Recommended Practices

Instrument Society of America has issued two recommended practices, "Coding of Thermocouple Wire and Extension Wire" and "Manometer Tables". The first mentioned tentative recommended practice, RP1.1, was prepared to bring about greater uniformity in the field of instrumentation. Tables give recommended symbols for various thermocouple combinations and extension wire.

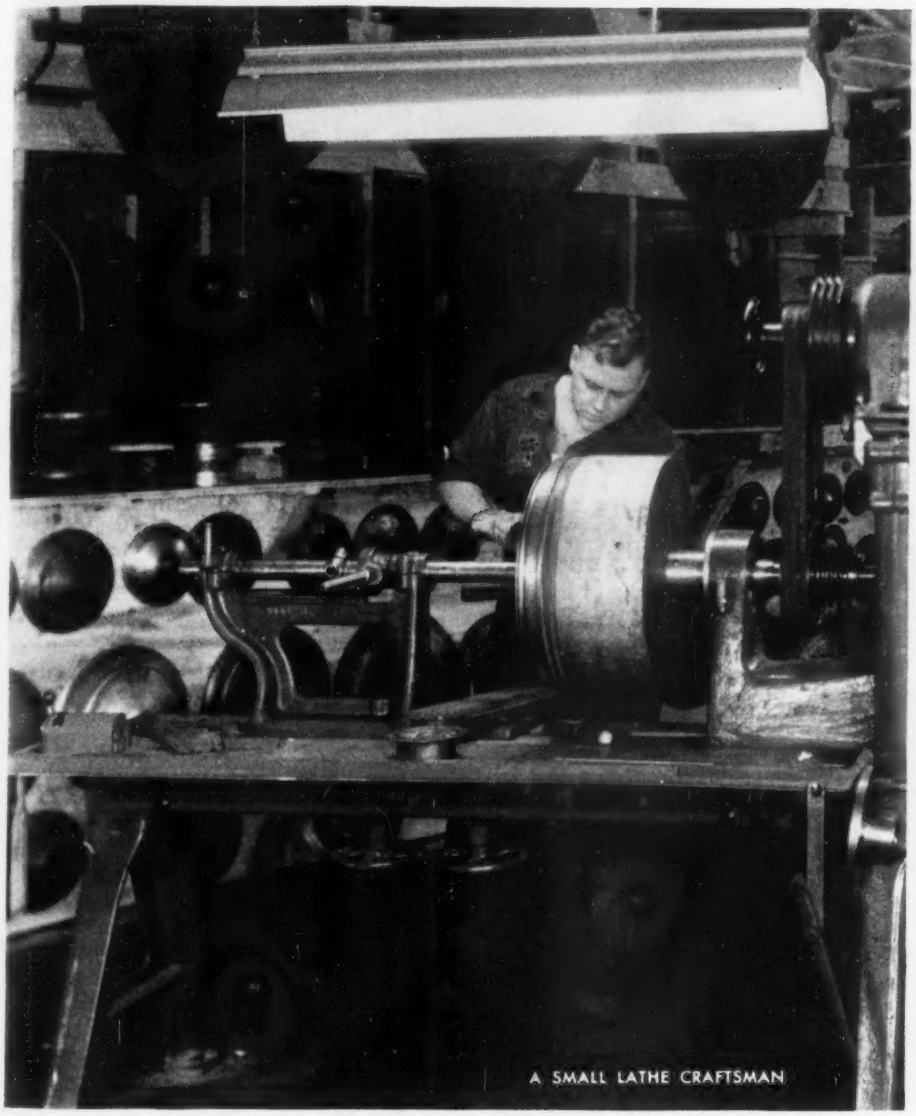
Last mentioned recommended practice RP2.1 presents abbreviations and fundamental conversion factors commonly used in manometry, recommended definitions of pressure in terms of column of mercury and water and for a large number of various temperatures. Both are available from the society, 1117 Wolfendale St., Pittsburgh 12, Pa. They are free to members, but cost nonmembers $1.00 and $2.00, postpaid, respectively.

—o—

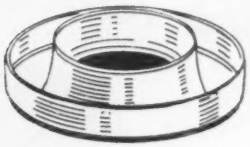
Improvements in shipping and packaging bolts, nuts and other fasteners were introduced recently by Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y. Most radical innovation is the "upside down" box cover which is labeled to permit upside down stocking while the label remains right side up—and legible. Since a box of bolts or nuts is always heavier than it appears to be, the new practice is expected to eliminate spillage which frequently results from tops slipping off heavy boxes when they are pulled from stock.

—o—

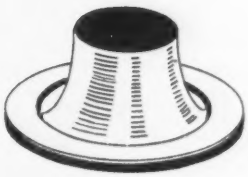
Proceedings of the Ferro furnace school, held by Ferro Enamel Corp., May 11 and 12, 1948, are available from that company. Included are all of the addresses, papers and discussions presented at all sessions of the school.



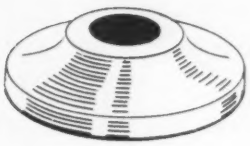
A SMALL LATHE CRAFTSMAN



Housing Trim Ring
O.D.—14⅞ inches



Ceiling Plate
for Airconditioning
O.D.—10 inches



Strainer for Cylindrical
Storage Tanks
O.D.—4¼ inches

Specialists in SMALL *Spinnings*

The spinnings illustrated above are only three examples of the many unusual small spinning jobs performed by CRAFT.

Modern, high-speed facilities and expert craftsmen give us an "inside edge" in handling highly specialized SMALL SPINNING jobs, as well as spinnings up to eighty-four inches in diameter. We work in any metal from 24 to 10 gauge—at a price which will appeal to you.

CONSULT us on your specific spinning problems. Submit blue prints for prompt quotations.

For GENERAL INFORMATION on our facilities and prices, send for FREE DESCRIPTIVE CIRCULAR

Craft METAL SPINNING CO.

EAST DUNDEE, ILLINOIS

SPINNING
ANNEALING
PICKLING
POLISHING

Here's what I hear from the boys who know *Firth Sterling* high speed toolholder bits—

They go for CIRCLE C in a big way! It's the top quality tool bit steel! *But its cost is negligible.* By increasing production even 5% —the resulting man and machine earnings completely eliminate the tool bit cost. And, it cuts materials many other high speed steels can't touch. You can't beat CIRCLE C.

There may be applications in your shop where Firth Sterling BLUE-CHIP (an 18-4-1 machining stand-by for many years) will do the work most economically and satisfactorily and where the top quality Circle C is not required. Or, if you want a still more moderately priced general purpose bit, Firth Sterling STAR-MO M-2 can fill the bill.

Whichever grade you require—if it's Firth Sterling, it's the best for your job.

Bulletin SL-2028 gives you the details on all Firth Sterling High Speed Toolholder Bits—write today for a copy.

Better yet, call your nearest Firth Sterling office for a Representative who can help you choose the right high speed toolholder bit for your particular job.

Firth Sterling

STEEL & CARBIDE CORPORATION

McKEESPORT, PA.

Offices and Warehouses in Hartford, Philadelphia, Cleveland, Detroit, Chicago, Dayton and Los Angeles. Offices in New York and Pittsburgh.

Distributors: Carey Machinery & Supply Company, Baltimore—York Machinery & Supply Company, York, Pa.—Tanner and Company, Indianapolis—Wm. S. Balden Co., Charleston—Huge-Fayle Company, Houston

In Canada: Chapat Engineering & Sales, Ltd., Hamilton, Ontario

Paint Booth

(*Continued from Page* 82)

air cylinder operates the escapement as well as the ejection kick bar in the barrel spinner, progressing one barrel. This unit is also very easily varied for barrel length.

The spinner unit is very simple. The two shafts mounted on sealed, self-aligning ball bearing blocks extend through the wall of the booth to an outside drive of V-belt and pulleys from its own motor. The kick bar is very conventional except for the back stop, which stops fast barrels. This has been a source of trouble in other booths. The backstop is solidly attached to the kick-bar shaft and drops down as the kick comes up.

A new type of spinner roll is used. It is of two-piece construction and is a modification of a collet chuck gripping the spinner drive shaft. Absolutely symmetrical, it can be cleaned by a scraper while rotating. The shaft, which is smooth, and devoid of keyways, can be cleaned in the same manner. In the event a barrel does not position correctly, there is no damage to the barrel and equipment by flailing lugs as with the older type of bolted, split rolls. The spinner is mounted over the water in the booth tank. Short angle rails lead off the back end of the spinner frame to the up-ender and are adjusted for various lengths.

Operating between a position in the booth immediately after the spinner and the conveyor outside the booth feeding the oven, is a unique up-ender, Fig. 2. It is similar to ordinary up-enders but varies in that it transports the barrel a considerable distance as well as shifting its axis 90 degrees. This means a long sweep, and heavy construction which is counter-weighted with a lead cylinder of 800 pounds. As the unit is pivoted on large ball bearings, a finger's touch would swing the up-ender before installation. To achieve the desired travel, axle of the up-ender had to be located in a recess formed under the side of the tank. The up-ender is built as an integral part of out-going conveyor frame. It is so designed that, when down, the up-ender is directly behind the spinner and when up the barrel is gently spotted on the conveyor. The up-ender remains up during the painting cycle. Aperture through which it passes into the booth is equipped with two swinging steel doors that open and close, mechanically with movement of the up-ender. Thus, when a barrel is being painted, the air flow is uniform and controlled

past the barrel, and the up-ender is outside behind the closed doors.

On out-going conveyor, two pintle chains carry the barrel on end to the oven. To carry the barrels off the sprocket portion of the conveyor to a similar portion of the oven conveyor, two small live rolls within the depression between the conveyors maintain a level driving plane for barrel progress. These rolls are chain-driven from the oven conveyor.

All operations may be pushbutton controlled during the setup period. Each pushbutton is electrically interlocked to prevent such occurrences as kicking a barrel off the spinner into the tank. The spinner motor must be "on" to energize the control circuit, which is powered from a transformer whose primary is connected to the spinner-motor-starter load contacts. Each paint gun can be set individually for its time interval, as the jog buttons operate timers controlling the respective guns.

—o—

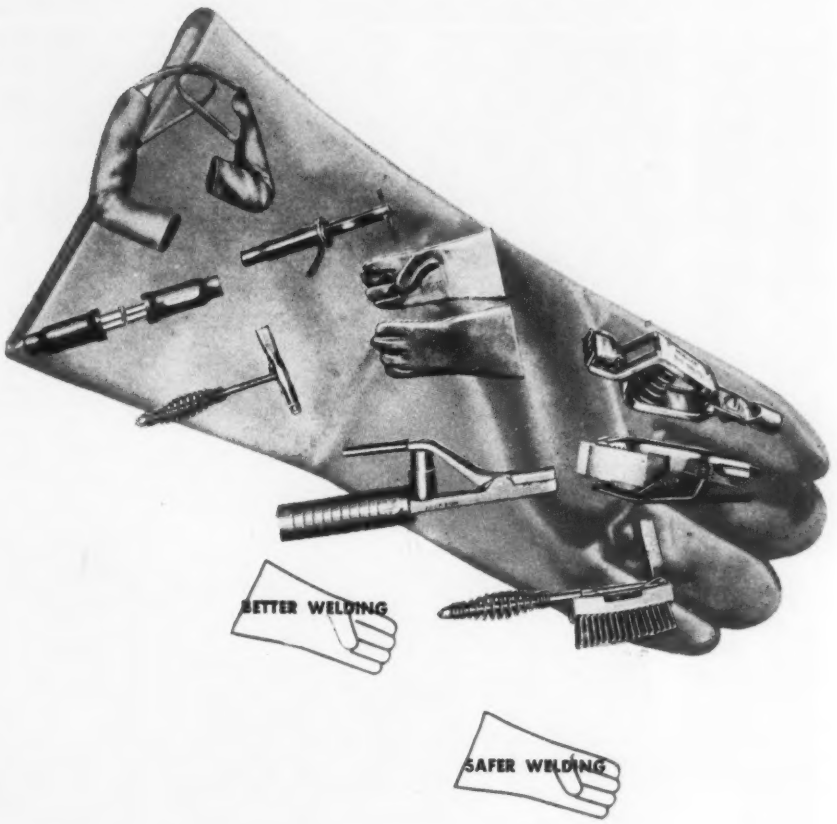
A lubricating oil testing kit, made by Gerin Corp., Red Bank, N. J., measures the four dangerous classes of contaminants: Change in viscosity due to fuel dilution or other causes; amount of asphaltic and other oil breakdown substances considered responsible for deposits; amount of dirt, metal particles, and other solids and water; and acidity showing whether corrosion is possible. Oil from four engines reportedly can be analyzed for all four classes of contaminants in 25 minutes.

—o—

A new long-wearing service entrance cable for carrying electricity from main power lines to industrial buildings is reported by United States Rubber Co., New York. Because of a natural rubber insulation around its conductors and an outside jacket of Neoprene, the cable is said to wear four to five times longer than other types, the company says. It is about ¼-inch smaller in overall diameter than other types on the market. Its weight is the same, however.

—o—

American Iron & Steel Institute, New York, has made available Steel Products Manual on carbon steel structural sections, section 4. It contains definitions, standard specifications and manufacturing and chemical practices, as well as standard mill tolerances, packaging, marking and loading methods, simplified practice recommendations and standard structural steel specifications.



ACCESSORIES TO THE PERFECT WELD

More and more fabricators—sold on the smooth performance of M & T's "SELECT 70"* group of arc welding electrodes and the M & T new, up-to-the-minute AC and DC arc welders—are specifying M & T accessories for all-around assurance of top-notch welding.

Accessories such as top quality holders, shields, connectors, cleaning tools and protective clothing boost speed, safety and savings on all arc welding, whatever the job.

All the essential accessories to the **perfect** weld are provided in the Metal & Thermit line of welding equipment . . . M & T branded—symbol of superior welding!

Write for catalog!

*Seventy selected electrodes designed by Metal & Thermit to cover every arc welding requirement at peak performance.

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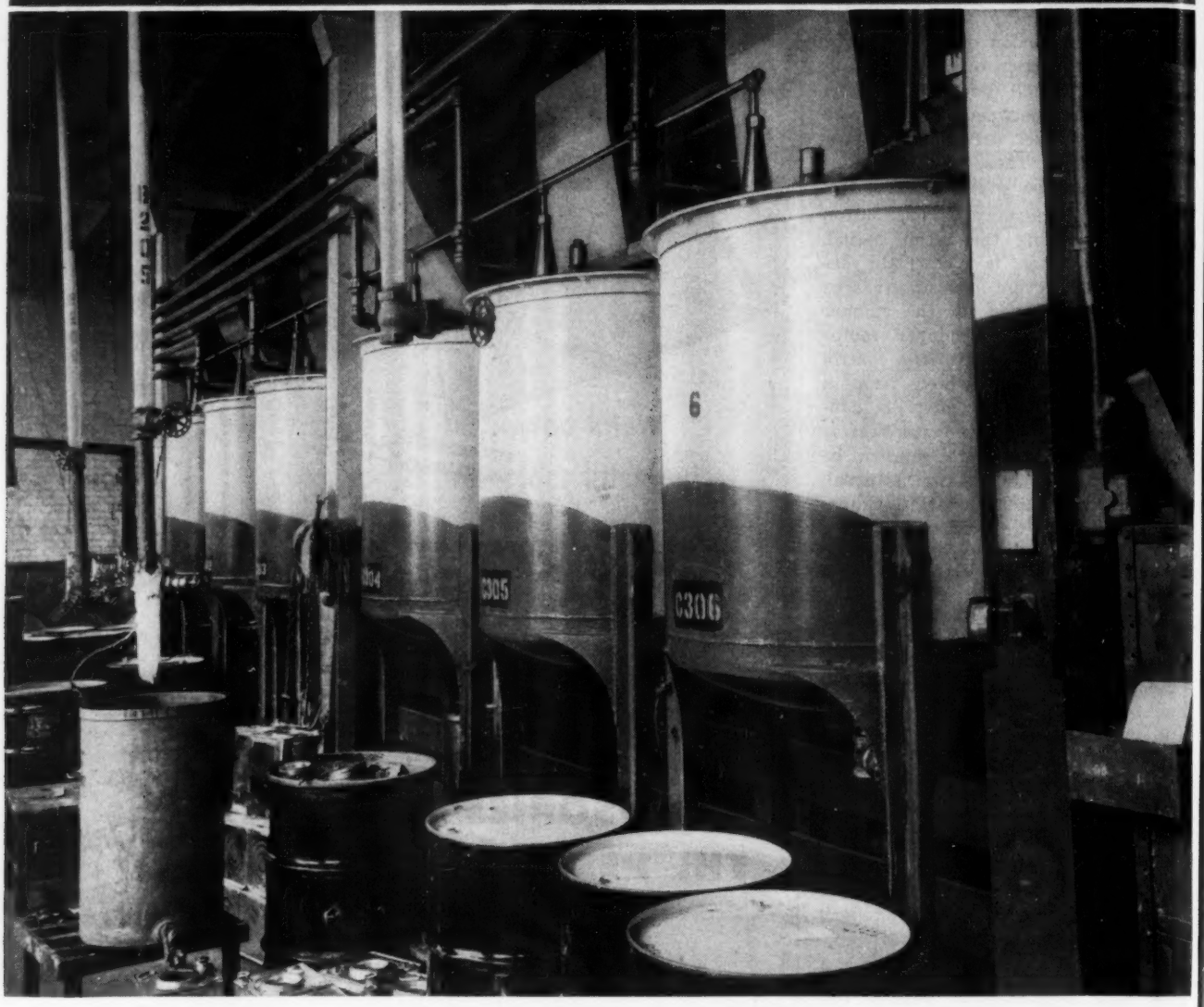
CHICAGO CINCINNATI CLEVELAND HOUSTON MINNEAPOLIS
NEWARK PHILADELPHIA PITTSBURGH SO. SAN FRANCISCO TORONTO

THIS USED TO BE A FIRE HAZARD



—BUT IT'S NOT ANY MORE

Years ago, a fire *did* start in one of the vats used in making protective coatings at a large lacquer plant. The blaze was quickly extinguished, without damage, by a 50-pound carbon dioxide (CO_2) wheeled unit.

But that fire convinced the plant management that things would be safer with built-in *automatic* fire protection. So they installed a *Kidde** system and gave it a 24-hour job to do. It's *always* ready to swoop down on fires in the 6 agitating vats shown, as well as in 7 mixing and 8 finished-product vats.

Because this *Kidde* system must guard three separate batteries of vats, automatic directional valves turn the CO_2 into the zone where fire's been spotted. And, as the CO_2 rushes along its path to the fire, it sets off pressure trips and switches that slam closed the open hatches on the vats, and shut down all machinery.

It's *all* automatic. An automatic *Kidde* extinguishing system never gets panicky, never does the wrong thing. Also, CO_2 won't dilute or contaminate materials in the vats.

That's just one instance, of course, of the thousands of tricky fire hazards protected by *Kidde* skill and equipment. *Whatever* your fire-protection problem, a Kidde representative can help you.

When you think of CO_2, call Kidde!

*Also known as "Lux"

The words "Kidde" and "Lux" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc.

Walter Kidde & Company, Inc. • 361 Main Street, Belleville 9, New Jersey

Kidde

Increased Capacity

(*Continued from page* 86)

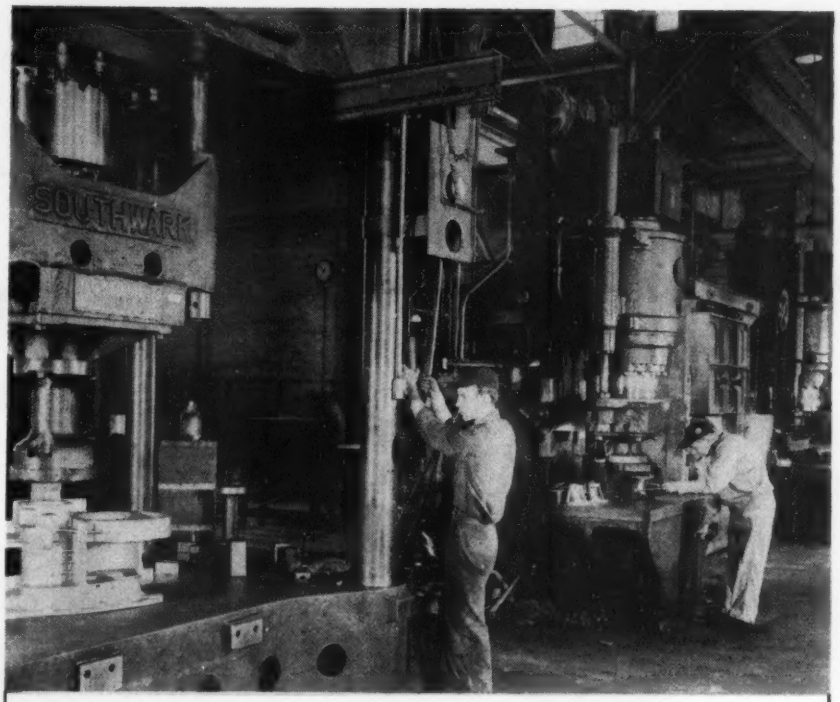
the larger units. Thus, continuity of rolling and other processes is improved by eliminating more frequent starts and stops for changing lighter coils of shorter lengths.

Product quality of both sheets and tin plate has been improved, due to features providing closer process control at all steps of their manufacturing. Notable changes that resulted in production of better tin plate included equipping the annealing department with new annealing atmosphere processing units, and installation of alkaline cleaners on the three electrolytic tinning lines then in existence.

Major installations of new equipment were for production of sheets, and comprised: A 54-inch, four-stand, cold-reduction mill; a 60-inch, high-speed temper mill; a 54-inch electrolytic-cleaning line; a 54-inch side trimming and slitting line; a 54-inch shear line for cold-reduced and another for hot-rolled products; 16 coil-annealing furnaces with 56 bases; and two 76-inch scrubbing and drying lines. Various changes and additions were made to the 80-inch continuous hot mill and 84-inch, three-stand, tandem cold-reduction mill to increase their capacities. New additions to continuous coating facilities include a galvanizing line and a terne coating line.

Furnace Capacity Increased 110 Per Cent — Modernization and improvement of the 80-inch continuous hot mill to increase the plant's over-all capacity for production of cold-reduced sheet steel and tin plate included installation of two additional slab-heating furnaces. Improvements to the three existing slab-heating furnaces increased capacities of the latter nearly 110 per cent to match the new units. Furnaces are shown in Fig. 1. Other mill changes included; replacement of handling equipment, vertical edgers, roughing and finishing guides; replacement of down-type coilers with new mandrel-type coilers designed to handle heavier coils; replacement of the scale-breaker; alterations to the slab squeezer and coil conveyor; replacement of the piler, coil conveyor, and center run-out table; and improvements to slab pushers. These and miscellaneous smaller changes were made to increase plant capacity by providing 12,000-pound hot-rolled coils for tin-plate and up to 20,000-pound hot-rolled coils for sheet products.

Flash welders were installed on No. 8 and 10 continuous pickling



Nobody can use . . .
a "JIBBER-JAWED" casting!

Nothing can be more troublesome than a "cockeyed" casting! They won't fit properly and they can't be machined as delivered; they're time wasters!

Visual inspection in the foundry can account for many defects before the casting is shipped, but there is always the element in the human equation that might not perceive inaccuracy when tolerances are minute!

In Unitcast foundries, every precaution is taken to assure casting accuracy. Every Unitcasting passes *thirty-three* inspection tests for material and contour flaws during it's development! Unitcasting's reputation for accuracy is no accident!

When *extra close* tolerances are required, mass-production orders of sufficient quantity can economically be passed through check dies to assure "dead-center" accuracy! This customer-approved operation saves many times the amounts that would be wasted by costly, superfluous handling of "ordinary" castings during machining or fitting.

Consult with Unitcast's representatives about their facilities for delivering accurate, dependable Unitcastings to suit your specifications; avoid the "jibber-jawed" time wasters!

Unitcast Corporation, Steel Casting Division, Toledo, 9 Ohio. *In Canada:* Canadian-Unitcast Steel, Ltd., Sherbrooke, Quebec.

PRODUCTS LAST **LONGER** BUILT WITH **STRONGER** UNITCASTINGS

UNITCAST
Corporation
ELECTRIC STEEL CASTINGS

up to 1/3 less space...
improved windings...
plate steel protected...
WESTINGHOUSE
NOW...
LUBRICATED for LIFE

YOU CAN BE **SURE**.. IF IT'S

Westinghouse

—and NOW...

Lubricated for LIFE!

Now . . . for the first time . . . you can install electric motors, or motor-driven machines . . . and forget motor lubrication *for life!*

Westinghouse Life-Line . . . industry's amazing new, all-steel motor . . . now completely eliminates the biggest element in the maintenance of motors and motor-driven equipment . . . the need for periodic motor lubrication.

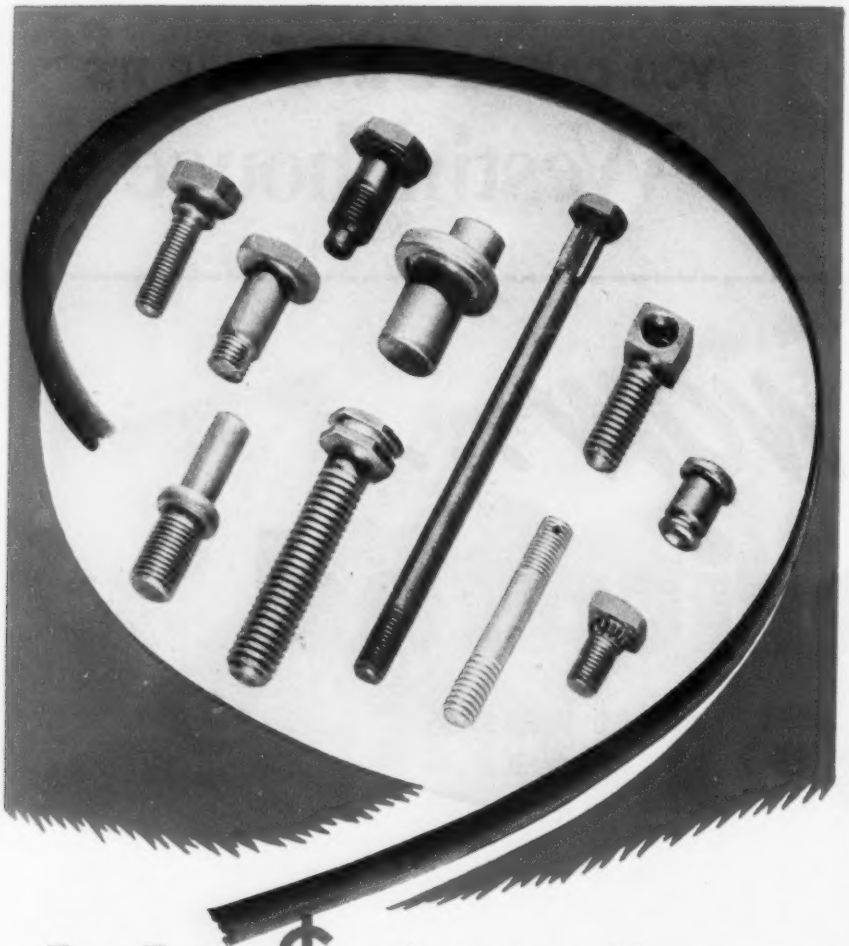
Eliminated, too, are two of the most frequent causes of motor burnouts and lost time . . . overgreasing and undergreasing of motors. Life-Line motors are equipped with sealed bearings, pre-lubricated for life with a more-than-ample supply of specially-treated lubricant.

Correct lubrication and long life are assured ...machine outages are reduced...motor drive problems are simplified, since motors can be located without need for constant accessibility.

Added to Life-Line's outstanding advantages of plate-steel protection, improved windings and more compact size, *lifetime lubrication* is one more important reason for starting to convert, today, to Life-Line power. Standard ratings are available from stock—others on short delivery schedules. Ask your Westinghouse representative for price and delivery on your requirements, or write P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21495

Westinghouse *Life-Line* Motors

WESTINGHOUSE



For Extra $avings on Your
Special Threaded Parts
use the KAUFMAN PROCESS
and CLEVELAND *Top Quality* SERVICE

You may be surprised to find how well and how economically your special fasteners and parts can be produced by the Kaufman Process. A cold forging process, it enables us to single or double extrude your parts, giving them added strength for their important job. A faster process, it enables us to give you prompt delivery, once your schedules are set. It pays you to send your blue prints and specifications for estimate.

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Top Quality
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ORIGINATORS OF THE
KAUFMAN DOUBLE EXTRUSION PROCESS
Specialists for more than 30 years in
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Ask your jobber for Cleveland Fasteners

lines to permit experimental welding of hot-rolled coils from the 80-inch continuous mill into 24,000 to 30,000-pound coils. Coilers on these lines were replaced and the guides altered.

Speeds of two five-stand tandem cold-reduction mills were increased from 1700 to 4600 fpm. Uncoilers, recoilers and related parts were replaced, to permit processing of heavier coils on these two mills, as well as on five electrolytic cleaning lines, replacing existing equipment which was too light to meet the new operating conditions. Temper mill uncoilers were reinforced and heavy-duty up-enders provided to meet increased load requirements.

Six coil-annealing furnaces with 16 bases were installed to provide additional annealing capacity. Height of 44 existing furnaces was increased and 135 existing bases were altered to provide for larger coils.

New shearing equipment includes five flying-shear lines for handling large coils at higher shearing speeds up to 1000 fpm.

Coil-storage conveyors were added at the continuous pickling lines along with flash welders, and improved charging and handling facilities. Side trimmers were installed and recoilers on these lines were replaced with heavy-duty units. These changes permit increased capacity by welding hot-rolled coils from the 80-inch continuous hot-mill end to end to form larger coils weighing 1000 pounds per inch of width.

Cold Mill Operates At 3000 fpm—Cold-reduction facilities were increased by the installation of a new 54-inch, four-stand, tandem cold-reduction mill that operates at 3000 fpm. The uncoiler and recoiler were replaced on the existing three-stand tandem mill and its speed was increased. Tensiometers, side guides, a scale and an up-ender were also installed on the latter mill.

A new continuous electrolytic-cleaning line was installed to provide capacity for cleaning cold-reduced sheet coils up to 48 inches wide.

A new 54-inch shear line for cold-reduced and another for hot-rolled products, and a new 54-inch side trimming and slitting line were added to sheet-mill shearing equipment. Improvement and relocation of several existing shearing and recoil lines were undertaken in addition to alterations to a line for heavy-gage hot-rolled products. These additions and changes were made to obtain required capacity for processing products in both sheet and coil form.

Sixteen new coil-annealing fur-

Announcing

A NEW STEEL and INDUSTRIAL SUPPLY SERVICE in CLEVELAND

For many years the Tri-Boro Steel Supply Co. has provided quality steel products to manufacturers in the Metropolitan Area of New York from its complete warehouse stocks.

And now, it is with great pleasure that we announce a similar service for the great industrial area of the Midwest with Cleveland as its hub.

In addition, we have established a Mill Supply Division in Cleveland . . . stocking drill rods, drills, taps, dies, hack saw blades and other items.

Charles A. Koons
President

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STRIP

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WIRE PRODUCTS

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Inert Gas Method

revolutionizes

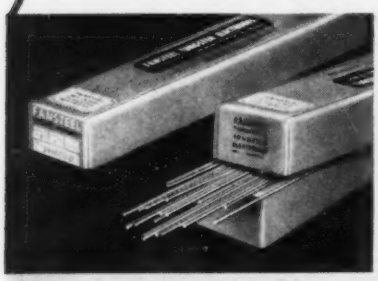
ARC WELDING

Tungsten Purity vital factor of its success

Fansteel **Premium Quality TUNGSTEN ELECTRODES**

From the smallest to the largest setups, arc welding by helium, argon, or atomic hydrogen processes brings new superiorities, new simplicity, new economies. Applicable to a wide range of fabrications, arc stability is absolutely essential. This depends entirely on purity of the tungsten electrodes used. Fansteel Tungsten Electrodes assure this purity—with its saving in electrode consumption—for these reasons:

- Fansteel trained metallurgists and quality control engineers control every step of processing from raw tungsten ore to finished electrode.
- Every electrode must pass the most rigid inspection. Cracks, surface impurities, dimensional errors and all other imperfections are eliminated.



Available in three surface finishes: In diameters up to 3/32" in drawn finish; from 1/8" upward in swaged finish; for extra precision requirements in all diameters with centerless ground bright finish. Tungsten electrodes made by Fansteel are 99.9+% pure tungsten. Vapor pressure 0.000005 mm at 4580°F is the lowest of all metals.

You are invited to send for new Fansteel illustrated Bulletin 1.102 for complete information on Tungsten Electrodes—valuable to all arc welders. Fansteel Metallurgical Corporation, North Chicago, Illinois.

PURE METALS

Tantalum, Tungsten, Molybdenum, and Columbium in sheet, rod, wire and special shapes and parts.

POWDER METALLURGY PRODUCTS

Finished or semi-finished shapes and parts of special analysis to achieve high strength, density, electrical conductivity, resistance to wear, impact, heat erosion, or combinations of these and other properties.

COPPER BASE ALLOYS

Copper alloyed with other elements, to combine high conductivity with strength, elasticity, resistance to heat, impact, or wear. Available in bars, rod, sheet, strip, castings, forgings, finished or semi-finished parts, for current-carrying springs and other parts, soldering tips, resistance welding electrodes, dies and fixtures.

11604-B

Fansteel

SPECIAL PRODUCTS

In Controlled Metallurgy

naces shown in Fig. 2 were installed, ten were rebuilt, and a normalizing furnace was relocated.

A new high-speed temper mill shown in Fig. 4 was installed and three additional units were rebuilt and relocated.

In the finishing and shipping departments, two new resquaring shears, a new oiling machine and levelers were installed, and some other existing equipment was relocated.

Other major items in the modernization program included: New high and low-voltage power distribution systems, feeder lines; water, gas, air and sewer lines; as well as additional railroad and transfer tracks and handling facilities.

Gravity Drop Hammer Uses Rod Clamp To Hold Die

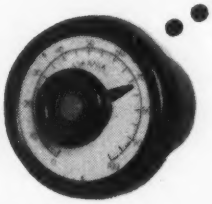
Ram and die are raised on the Ceco-Drop gravity drop hammer, built by Chambersburg Engineering Co., Chambersburg, Pa., by a piston and rod operating in a steam or air cylinder. At the top of the stroke the air or steam is exhausted and the ram and die drop by gravity. Holding the ram at the top of its stroke is accomplished by a clamp which comprises two steel blocks supported in a suitable frame. The clamp is held in a horizontal position by an air valve when the rod is moving up or down, the rod moving freely between the surfaces of the clamping blocks.

When it is desired to hold the ram at the top of the stroke, or at any point on the down stroke, clamp drops and the clamping blocks grip the rod instantly, halting all movement. The rod may be released by lifting the clamp to the horizontal position. Replaceable shoes form the wearing surface between clamping blocks and rod and an eccentric pivot action is provided to take up the normal wear.

Time Study Film Laboratory Expanded

Expanded industrial engineering film loan library of the University of Iowa, Iowa City, includes sixty-five 16 mm sound and silent films. It is stated that last year over a quarter of a million people saw these loan films, distributed by the university's Bureau of Audio-Visual Instruction.

Films available are described in extension bulletin 631, available without cost from the Bureau of Audio-Visual Instruction, Extension Division, State University of Iowa, Iowa City, Ia.



TRANSMITTER

Operate VALVES, THROTTLES, MACHINES, VARIABLE DRIVES . . .

Up to 1,000 FEET AWAY

SIMPLY, ACCURATELY, WITH THE ASKANIA ELECTRONIC SERVO SYSTEM

Consider the advantages of operating mechanisms from a remote point up to one thousand feet away — for equipment in a dangerous, inaccessible or inconvenient location. A central control system for several of the receivers is possible. Precise operation is assured by the system's accuracy of ¼ of 1%.

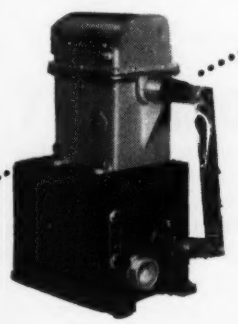
Operating on a standard 115 volt a-c current, the standard receiver shown in the illustration can offer torques up to 220 pound-inches. With the addition of a hydraulic cylinder, torques as high as 7,500 pound-inches can be achieved.

Almost any combination of the three units can be devised to permit multiple networks of transmitters and receivers.

All components of the system are constructed for heavy duty, rugged industrial operation. Dust-proof, cast metal cases withstand shocks, vibration and corrosion. All circuits and tubes can be reached easily without impairing the operation or original installation. Only two electrical supply line connections are needed for the entire system. Write for full information.

AMPLIFIER

RECEIVER



Accurate, powerful, simple remote control of dampers, valves, gates, throttles, pumps, machine tools, variable speed settings . . . can be achieved with a combination of the Askania Electronic System components shown in the illustration. A position signal selected at the transmitter or amplifier either manually or by means of cams, gears, or linkages causes the receiver crank arm to change position over a 90 degree arc.

ASKANIA Controls

Send for Bulletin 138 A

ASKANIA REGULATOR COMPANY

A Subsidiary of General Precision Equipment Corporation

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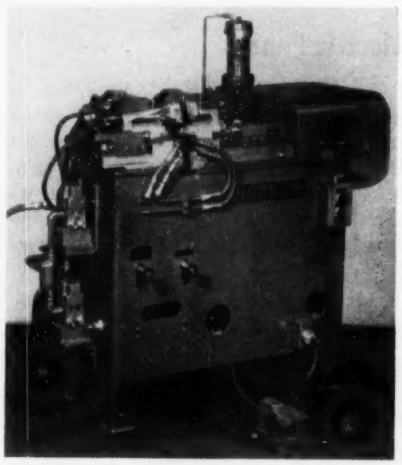
USS

UNITED STATES STEEL

New Products and Equipment

Flash Welder

Automatic control of flashing and upset with the entire welding sequence precisely synchronized and reduced to a pushbutton process is a feature of the Synchro-Matic flash-butt welding machine, made by Thomson Electric Welder Co., Lynn, Mass. It is provided with settings and calibrated scales for upset and



flash-off distances and for welding time. Values recommended or known to produce good welds are used to set up the machine and the work is clamped. Thereafter, once the operation is initiated, the machine takes over.

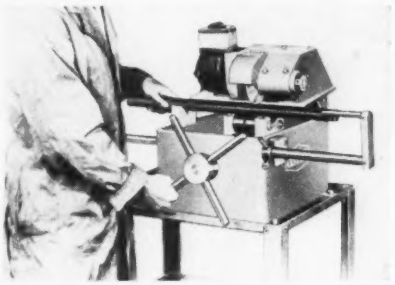
Flashing takes place during a relatively slow but accurate and smooth acceleration. At the most favorable moment, the upset occurs as an additional acceleration of the moving platen, producing the actual weld. Machine operation involves only three simple settings and pushing a button. Weld quality can be duplicated exactly on a production scale in bronzes, brasses and aluminum and magnesium alloys.

Check No. 1 on Reply Card for more Details

Pipe Cutter

Large or small quantities of pipe within the range of ¼ to 2 inches may be cut off with the No. 662 Cut Master cutting off machine, made by Oster Mfg. Co., 2057 E. 61st, Cleveland 3, O. Sixty pieces of 2 inch or 150 pieces of ½-inch pipe can be cut off in 10 minutes. Machine motor is a ½ hp 10,000 rpm universal, variable speed, geared head type. Gear ratio is 29.25 to 1.

As the hand wheel is turned, the cutter wheel is moved up or down. Effort of operator is reduced to a minimum by a feed screw mechanism. Rollers supporting the pipe to be cut off are mounted on needle bearings to minimize friction. Rollers are groved to prevent breakage of the cutter

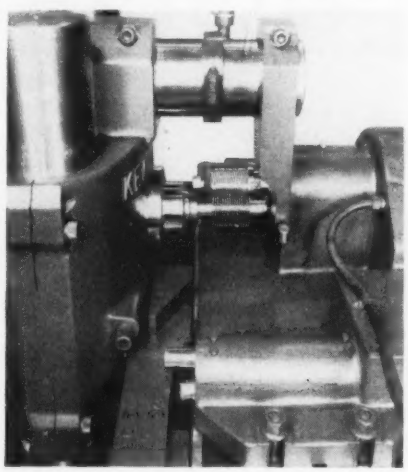


wheel which is ground to reduce the burr on the pipe to a minimum. A steel stand is available for the 225-pound portable machine.

Check No. 2 on Reply Card for more Details

Indexing Milling Machine

Arranged with an automatic index fixture and all necessary tooling for milling irregularly spaced vent slots in piston rings is the model 2-20 milling machine announced by Kent-Owens Machine Co., Toledo, O. A group of rings is mounted on an



adaptor which is placed in the fixture and the table feed is then engaged. Balance of the operation, including milling, indexing, etc., is completely automatic. After the last slot has been milled, the fixture or table of the machine will return to loading position and stop. Additional work holding adaptors are supplied so that the unloading of the rings on the adaptor can be handled while the rings in the fixture are being milled.

Machine has a 12 x 42-inch table with 20-inch table travel. Twelve spindle speeds from 64 to 860 rpm are available. Drive is taken from a standard foot mounted ball bearing motor at the rear of the machine and goes vertically through a splined drive shaft, worm and worm gear, through pick-off gears directly to the cutter.

Check No. 3 on Reply Card for more Details

Adjustable Angle Plates

All jobs that are difficult to hold in a vise may be easily set up for

drilling, milling, grinding, layout and inspection with the Palmgren adjustable angle plates, made by Chicago Tool & Engineering Co., 8383 South Chicago Ave., Chicago 17, Ill. Bases are provided with bolt lugs for fixing the angle plate to the machine table. Eight bolt slots are provided on the surface plate for holding work.

Plates can be adjusted to 90 degrees and are graduated for all angles, ready for instant use by locking the adjustable support screws. They can be furnished with or without graduated swivel bases. No. 256 surface plate has a 6 x 6-inch plate and No. 249 has a 9 x 9-inch plate.

Check No. 4 on Reply Card for more Details

Hydraulic Cylinders

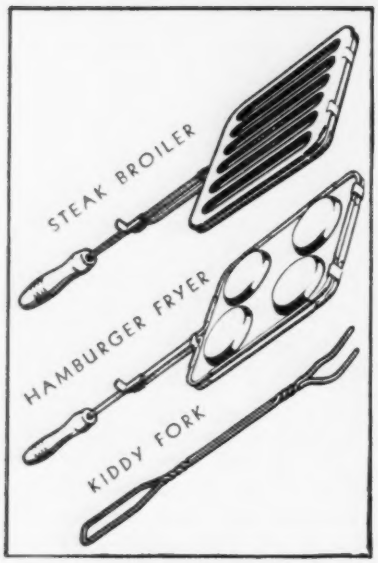
Hydraulic cylinders with 10 and 12-inch bores are being offered in the high pressure range of 2500 to 2500 psi by Miller Motor Co., 4027 N. Kedzie Ave., Chicago 18, Ill. As they are offered as standard models, special designing and manufacturing generally required for such cylinders are eliminated.

Both the 10 and 12-inch models are available in single and double rod end styles and in a choice of piston and piston rod seals for different applications, including automotive step-cut piston ring piston seal and a leakproof, low friction piston cup piston seal. Both are interchange-

For campfire fun!

US* PICNIC ACCESSORIES

made with
KEYSTONE WIRE



U. S. Picnic Accessories give added enjoyment to the art of campfire cookery.

You'll notice that wire is of prime importance in the construction of these items. For this reason the manufacturer specifies Keystone wire that has an **extra brite finish** for added sales appeal . . . proper ductility to withstand severe twisting operations . . . and the necessary strength to hold its shape under rugged conditions.

Manufacturers know they can depend on Keystone wire to fulfill every industrial wire need.

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SPECIAL ANALYSIS WIRE
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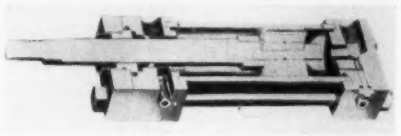
able on the same piston rod. Cylinders conform to the J.I.C. hydraulic standards for industrial equipment. They have nonbreakable solid steel

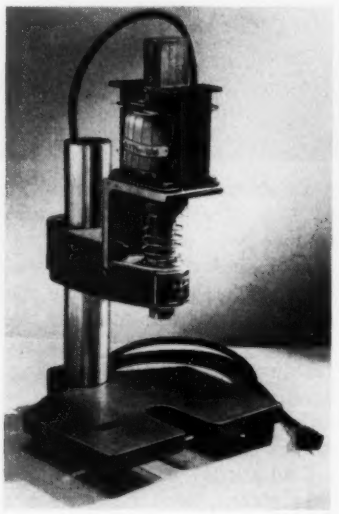


heads, caps and mountings, hard chrome plated piston rods and replaceable dirt wiper seals.

Check No. 5 on Reply Card for more Details

Electric Punch

An impact of more than 1 ton is delivered by the new high speed model Electropunch manufactured by Black & Webster Inc., Needham, Mass. The model BS 1 tool incorporates a high temperature silicone insulated coil in a ruggedly construc-



ted solenoid which permits it to operate continuously at better than 150 blows per minute.

It is suitable for staking, riveting, marking, wire cutting, blanking, forming and drawing of metals, plastics, fabrics, etc. It weighs 45 pounds and requires less than 1 square foot of bench space.

Check No. 6 on Reply Card for more Details

Squaring Shears

To accomplish combined increase in strength and rigidity with lightness in weight and easy action, Niagara Machine & Tool Works, 637 Northland Ave., Buffalo 11, N. Y., is fabricating its new line of 16-gage capacity foot squaring shears completely from steel. The bed, a rigid one piece weldment and the deep crosshead which is guided in flat bronze ways, give solid nondeflecting

For heavy-tension cold-rolling,

Bliss specifies SKF Bearings on Reels

The New Bliss 24″ x 84″ Tension Reel . . . 800 HP at 200 to 400 RPM . . . rolls smoothly and accurately on 4 SKF Self-Aligning Spherical Roller Bearings. Coiling strip steel under heavy tension, for the cold-rolling operation, is an important step in steel processing. The reel must stand up under almost continuous duty . . . and to assure bearing efficiency Bliss looked to SKF.

Heavy tension deflects the drum shaft, but the SKF bearings have undiminished capacity to absorb the working load. The deflection is always greatest at the heaviest loads . . . thus, inherent rolling alignment is of primary importance.

This is but one application of SKF bearings, our engineering staff can help you with your bearing problems. Write: SKF Industries, Inc., Philadelphia 32, Pa.

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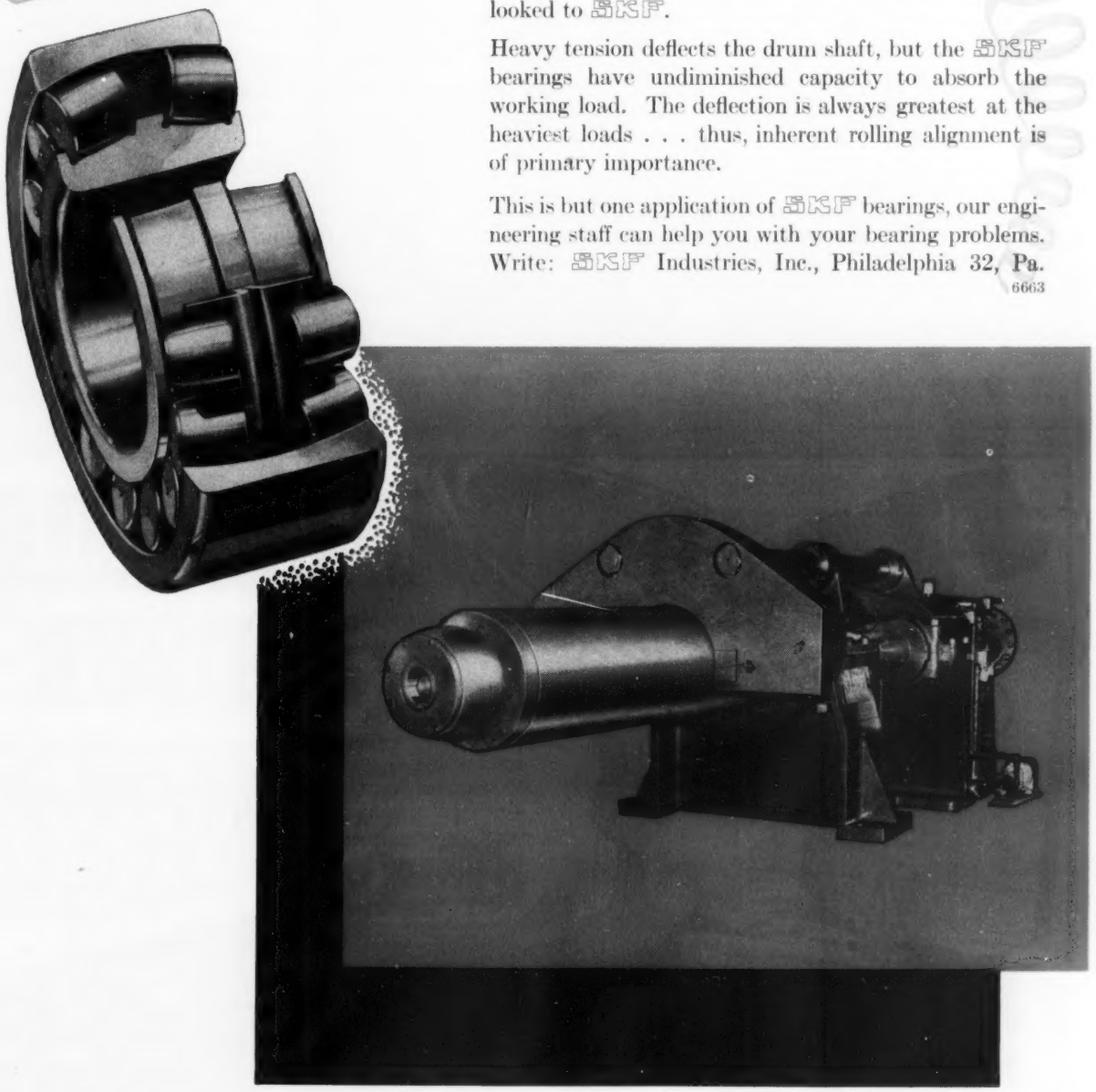


Industrial bearings engineered by SKF

support to the knives, producing accrate, clean and square cuts.

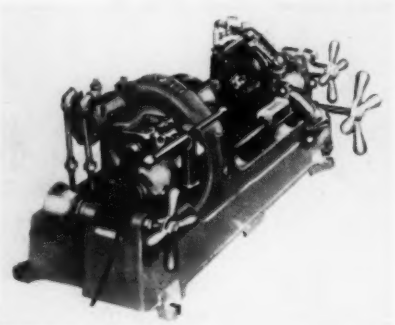
Well balanced action of the shear is due in a large part to the unusually long crosshead counterbalance springs concealed behind the panel housings. The shears, offered in 30, 36, 42 and 52-inch widths, have a large torsion-resisting cross shaft which assures equal motion on each end of the crosshead regardless of where the operator applies pressure to the full length nonslip treadle.

Check No. 7 on Reply Card for more Details

Threading Machine

Sufficient power to thread ⅛ to 2-inch pipe and ¼ to 1½-inch bolts is provided by model B portable pipe and bolt threading machine manufactured by Beaver Pipe Tools Inc., 1001 Dana Ave., Warren, O. With drive shaft and geared tools, the 225 pound tool will thread up to 8-inch pipe. Operation is with a universal alternating or direct current motor of 110 or 220 v, 25 to 60 cycle.

Pipe threader has an automatic switch lock and chuck wrench holder as well as an eccentric spool pipe-steady (independent of spindle) which absorbs the "whip" of long lengths of revolving pipe. A gear driven oil pump provides an ample flow of coolant. Other features include: Quick-opening, fully-adjustable ring-type dieheads; ball bearing, self-centering



wheel-and-roller cutoff; righthand operation; and 13 inches of working space. Tool has a 3-jaw universal chuck and 186 different kinds and sizes of dies are available.

Check No. 8 on Reply Card for more Details

Bar Bender

Cold bends on the job may be made in aluminum, copper, brass and mild steel bar or strip with the Form-Bar bender, made by W. R. Scott & Son Inc., 234 S. 11th St., Newark, N. J. Distributed by Graybar Electric Co., New York, N. Y., the bender is capable of handling a range of sizes from ⅛ to ½-inch in thickness and up to 6 inches in width. It is a portable tool and may be handled by one man.

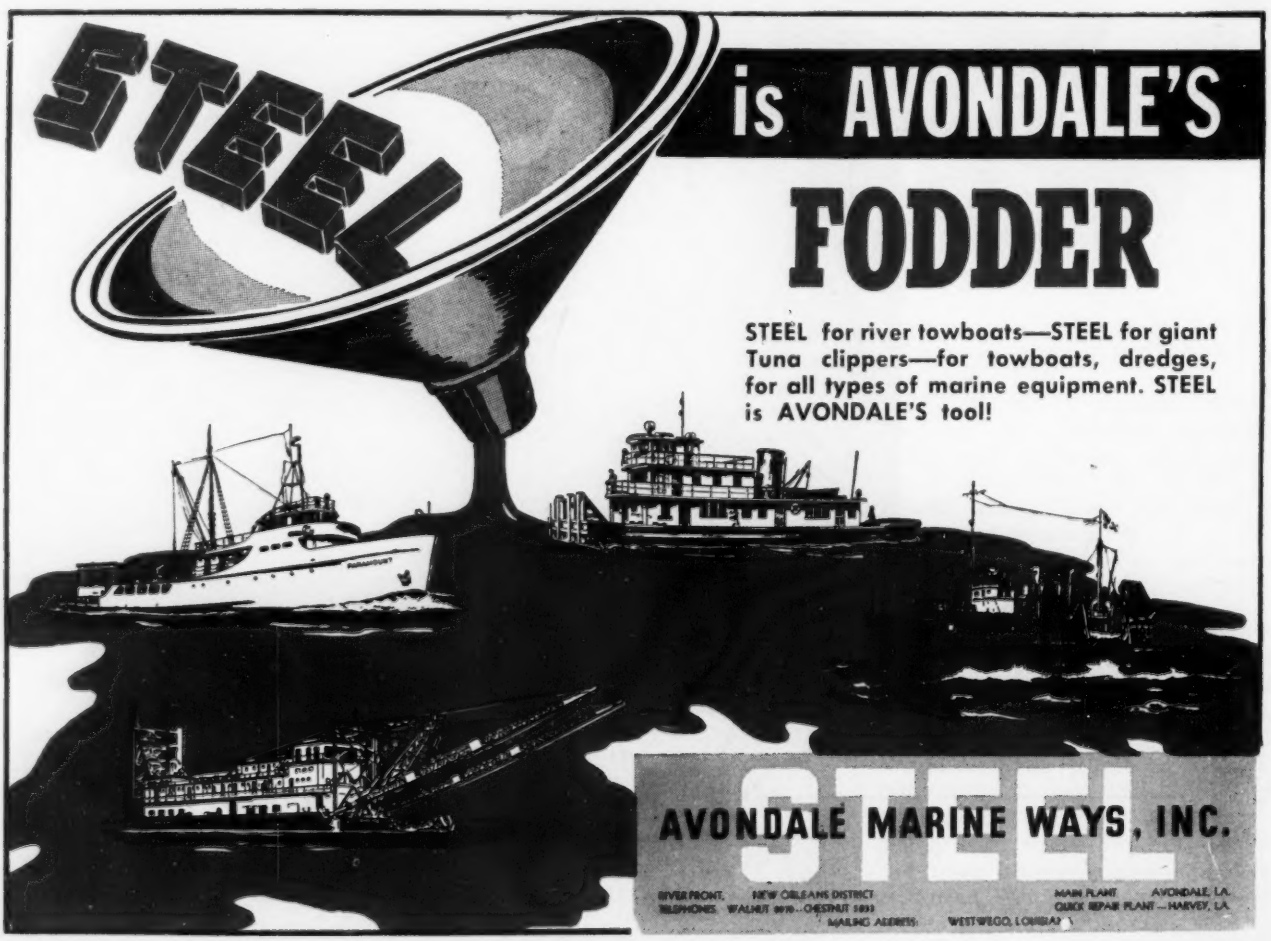
Bends up, down, side ways and twists, as well as short offsets and Z-bends can be made. A set-up is provided for duplicate bending. A vertical mounting position makes the tool flexible for handling the longest length of material.

Check No. 9 on Reply Card for more Details

Palletless System

Mechanized shipment of merchandise without use of pallets in transit is possible with a new type pallet and a push-pull attachment for Skylift electric fork trucks, announced by Automatic Transportation Co., 149 W. 87th St., Chicago, Ill. The attachment includes multiple forks, a device for pulling loads on board and a device to push them off the forks into position. The corrugated metal pallet has two sets of openings which permit the truck to lift the load and truck together or to remove the load from the pallet.

Before the load is palletized at the start, it is placed on a sheet of heavy paper. Then paper and load are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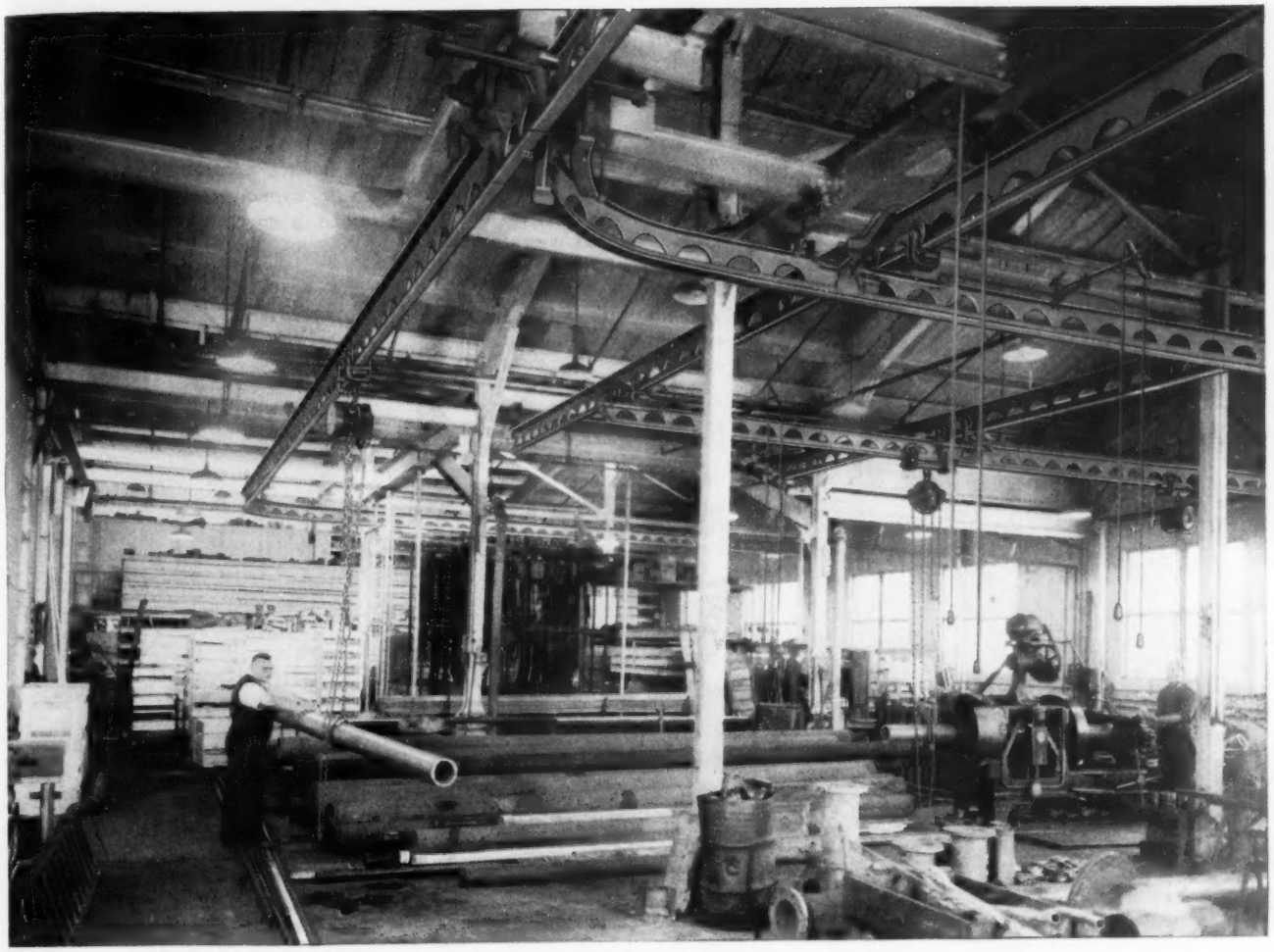
FODDER
STEEL for river towboats—STEEL for giant Tuna clippers—for towboats, dredges, for all types of marine equipment. STEEL is AVONDALE'S tool!
AVONDALE MARINE WAYS, INC.
STEEL

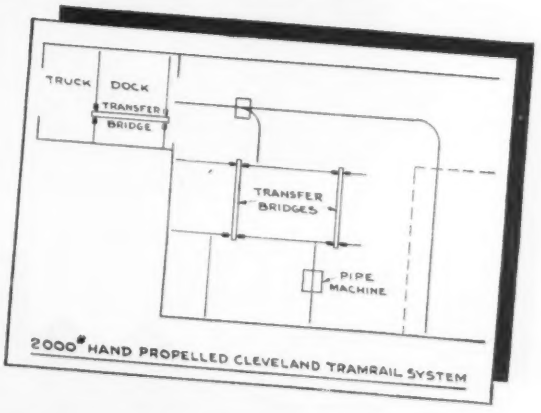


TRAMRAIL SYSTEM *SIMPLIFIES* PIPE HANDLING

Long, heavy pipes of various diameters are easily handled by one man with a simple hand propelled Cleveland Tramrail system at the Garth Company, Division of Robert Mitchell Company, Ltd., Montreal, Canada. The system includes overhead trackage and three transfer bridges, one of which is used for unloading trucks.

The Tramrail equipment makes it easy to place pipe in the threading and cut-off machines and support it while being worked on in these machines.

The overhead system which has a capacity of 2000 lbs. handles the pipe in a fraction of the man-hours that would otherwise be required. It requires practically no maintenance and is an important aid to safety.



2000# HAND PROPELLED CLEVELAND TRAMRAIL SYSTEM

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THE CLEVELAND CRANE & ENGINEERING CO.
7840 East 284th Street • Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

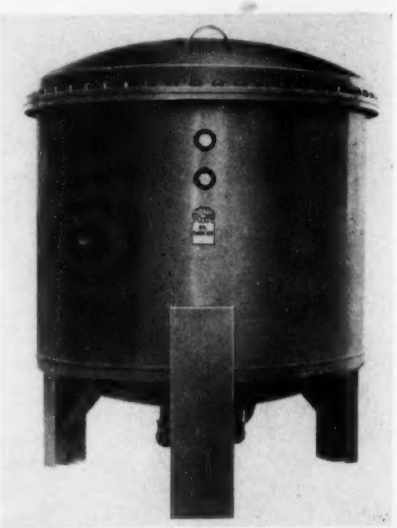
drawn onto the forks, lifted slightly and placed on the pallet. In this position it can be carried, stacked and detiered in the usual manner. When ready for shipment out of the plant, still on the pallet, the load is detiered and taken to the shipping dock and there the forks are inserted in the second set of openings in the pallet. The load together with the paper sheet is lifted clear and the truck takes it into the box car and the new attachment pushes it into position. Load is removed from box car or motor truck by pulling on to the forks by the pull device.

Check No. 10 on Reply Card for more Details

Oil Purifier

Employing seven filtering units, the multiple refill-type oil purifier, made by Honan-Crane Corp., 636 Wabash Ave., Lebanon, Ind., has a maximum capacity exceeding 2100 gallons per hour of 50 seconds viscosity color clean oil on continuous circulation. It provides the highest flow rate consistent with maintenance of clarity and the low neutralization number of the oil. Inside of the unit's steel shell, seven individual units are mounted on center tubes.

Each unit consists of a perforated steel basket containing a cloth bag with a capacity of 104 pounds of Cranite, a specially processed fullers



earth. Unit itself is 4 feet in diameter and 6 feet high. Actual flow rate of the purifier, which is automatic in operation, depends upon the viscosity of the oil, amount of contamination and pressure drop through the unit of the oil being purified.

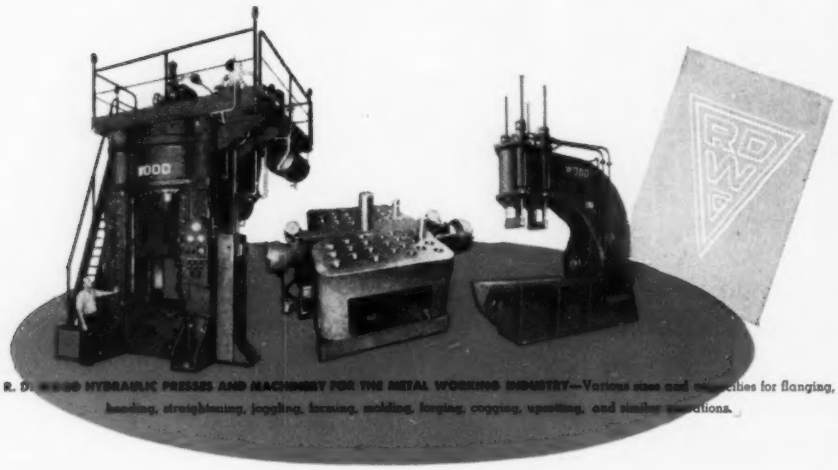
Check No. 11 on Reply Card for more Details

Steel, Tool Racks

Pollard Brothers Mfg. Co., 5513 Northwest Highway, Chicago 30, Ill., are manufacturing a line of tool and die and sheet steel racks. Each shelf on the tool and die rack (illustrated)

will carry 600 pounds or more. The four upright posts are made of standard steel angles measuring 1½ x 1½ x ⅛-inch. Shelves are made of 16 gage steel and pierced for four ¼-inch stove bolts on each corner. Lower shelf is 2 inches from the floor and the five nonadjustable shelves above it have a clearance of 10 inches between shelves. Total rack height is 63 inches.

Sheet steel racks are of the sec-



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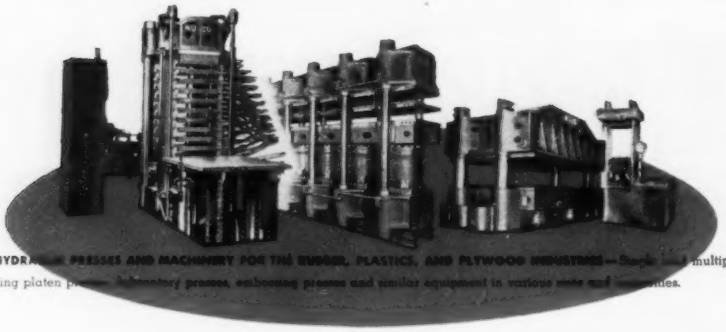

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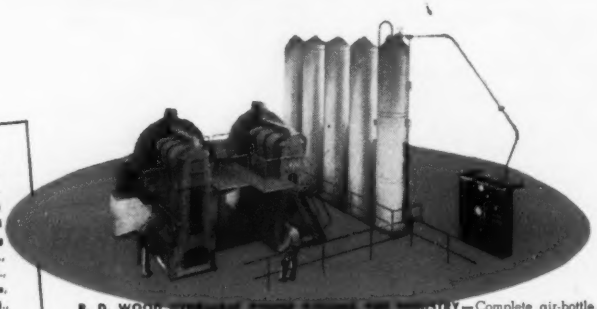

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for real *Fabricating Economy*

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STAINLESS STEEL SHEET and STRIP

Do you want more area per ton?
Are you interested in stainless steel that has better than 200,000 p.s.i.?
Are you interested in reducing your breakage significantly?
Do you want to reduce your polishing costs?

MicroRold can accomplish any or all of these objectives!

Precisely processed, MicroRold stainless is held to exceptionally close tolerances throughout entire length and width. These tolerances, as low as 3 per cent of specified thickness, mean less waste and spoilage—larger yield per ton.

MicroRold surfaces are dense, clean, smooth and even. Polishing costs are substantially reduced in addition to improved yields. Nicks, scars and thin spots are minimized when you use MicroRold.

MicroRold SPECIFICATIONS

SHEETS

Max. 36" Wide	#4 and #7 Finish	.012 to .109
36" Wide	2B and 2D Finish	.010 to .078
36" Wide	¼, ½, ¾ Full Hard	.010 to .078
36" Wide	As Rolled	.005 Min.
36" Wide	Physicals	As Rolled Condition
	p.s.i.	220,000 to 300,000
	Elongation	4% 1%
	Yield	180,000 to 225,000
Max. 30" Wide	2B and 2D Finish	.005 Min.

STRIP
.010 to .078 Inch in No. 2 and No. 1 Finish

TYPES
301, 302, 304, 316, 321 and 347

TEMPER GRADES
301 and 302

For Specifications beyond this range contact mill.

WASHINGTON STEEL CORPORATION

WASHINGTON, PENNSYLVANIA

tional type, made so that one section may be added at a time. Racks may be made as high as they can be conveniently worked. Length may be sufficient to take care of the sheet length to be racked. Individual racks will handle a 36-inch square sheet measuring 42½ x 42½ inches. The 11-inch height of this rack allows 9 inches of clear opening. A single rack can easily be moved about the shop with a lift truck.

Check No. 12 on Reply Card for more Details

Grinding Machine

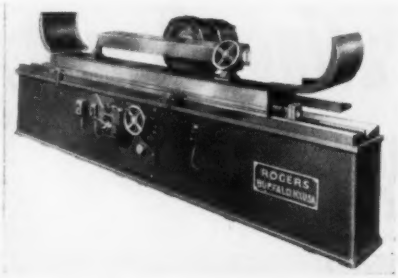
Grinding, polishing and deburring operations may be performed on a new belt grinding machine made by Delta Manufacturing Div., Rockwell Manufacturing Co., 600 E. Vienna Ave., Milwaukee 1, Wis. Occupying a minimum of floor space, the basic machine consists of arbor head, straight-faced contact roll, idler unit and abrasive belt. Arbor head is constructed of fine grained gray iron casting. The ⅝-inch arbor shaft is precision ground and runs on preloaded lubricated for life ball bearings.

Aluminum oxide belts in four different grits are available. Power from motor to arbor head is transmitted by two V-belts. Machines may be furnished with two vertical, one vertical and one horizontal, one horizontal or two horizontal grinding belts. Alignment of the 2½-inch wide grinding belts is provided for.

Check No. 13 on Reply Card for more Details

Knife Grinder

A hydraulic drive which provides variable table speeds from 10 to 70 feet per minute is a feature of the type NT hydraulic knife grinder, announced by Samuel C. Rogers & Co., 191 Dutton Ave., Buffalo, N. Y. The fine adjustment of grinding speed



permits the operator to select and obtain a speed for perfection of finish at any given stage of the grinding operation. Self-aligning 5-inch V-ways on the cabinet base and carriage absorb grinding pressure and permit heavy cuts and fast feeds with a minimum of vibration.

An automatic motor driven oiling system provides a constant, clean film of oil for table and bed ways. A separate 2 hp motor controls the hydraulic system. The 16-inch segmental grinding wheel is operated from a 7½ or 10 hp motor as desired. Grinders are available in sizes of 38, 48, 78, 90, 102, 110 and 134 inches.

Check No. 14 on Reply Card for more Details

Grinder Handpiece

Speed of all Wyco Grinders, whether old or new, multiple or single speed, may be multiplied with the No. 1300 step-up handpiece announced by Wyzenbeek & Staff Inc., 838 W. Hubbard St., Chicago 22, Ill. Using No. 1 to No. 5 shafts, and replacing the old standard handpiece, the new unit, by means of gear step-up, speeds the work up to 5000 rpm or higher, with ¼-inch mounted wheels. Carbide cutters, rotary files, mounted grinding wheels and abrasive rolls may be used.

On standard 3600 rpm, single speed

PACKAGE CONVERSION BY BLACK & DECKER

Topflight Tape cheaper than special imprint

The Black and Decker Manufacturing Company of Towson, Md., was one of the first industries to discover the very practical and economical way of adapting inventories of printed cartons to use for a different specification. Illustrated here is a practical demonstration.

110 and 220 volts

Black and Decker are the largest makers of electric hand tools used in industry and by home craftsmen all over the world. In producing such tools as drills, grinders, saws and sanders, more than 90% are equipped with 110 voltage motors. However, a small percentage of each lot is equipped with 220 volt motors, and to properly identify the contents Black and Decker convert printed cartons by covering the 110 designation with Topflight Tape reading 220. And the tape is sure to stick.

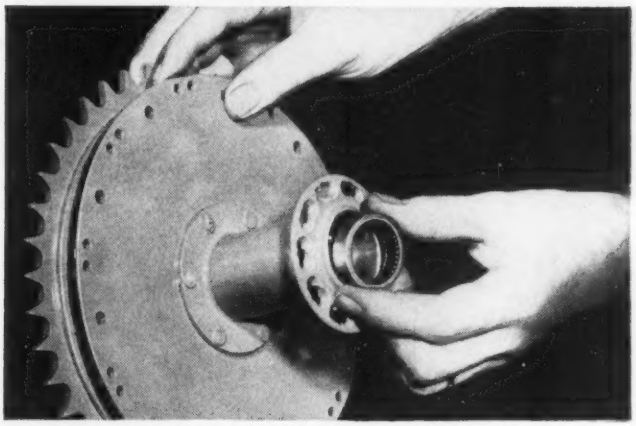
TOPFLIGHT TAPE COMPANY

ERWIN HUBER, *President*

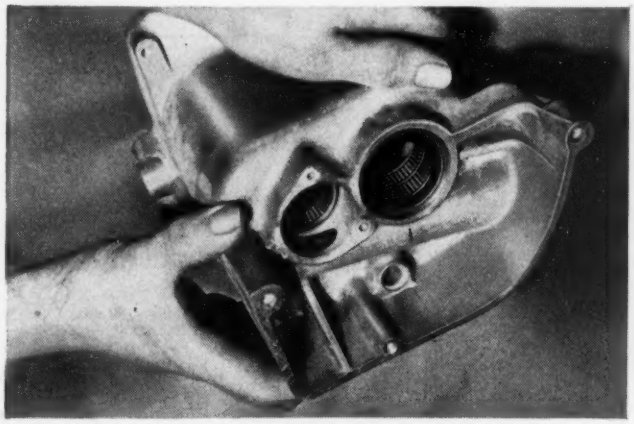
YORK PENNA.

Torrington Needle Bearings Specified For Lighter Design and Longer Life In Indian Motorcycles

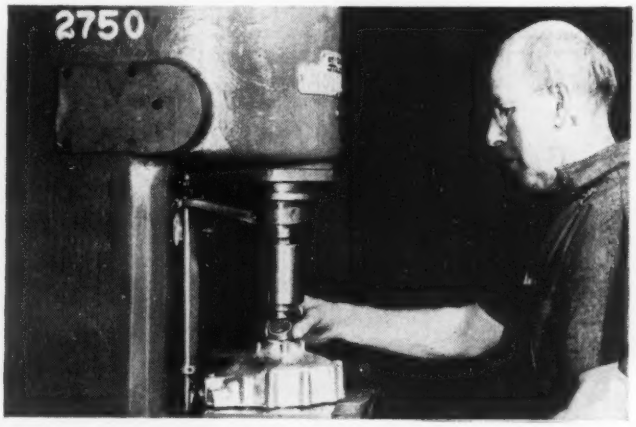
The new Arrow and Scout Motorcycles are designed throughout for lightness, power, safety and economy by Indian Motocycle Company. To withstand severe shock loads, reduce friction and secure compact design, Indian specifies Torrington Needle Bearings—22 in the Arrow and 24 in the Scout.



Needle Bearings take the jar of rough riding at high rotating speeds in the rear wheel hub (above) and the front wheel hub. With their full complement of small diameter rollers, Needle Bearings take less space and provide higher radial capacity than any other comparable anti-friction bearing.

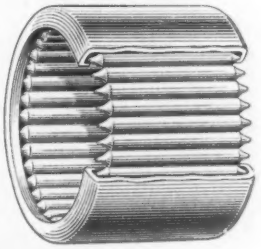


More horsepower per pound is delivered by the new Indians. Power loss is reduced with 8 Needle Bearings in the transmission. Two Needle Bearings on the main shaft give unusual stability, assuring efficient sealing with the standard oil closures pressed in behind them.



Manufacturing economy is assured by the easy installation of Needle Bearings in simple, easily-fabricated housings. Needle Bearings mean operating economies, too—minimum attention for maintenance and lubrication. Past experience indicates these efficient bearings will serve the life of the motorcycles.

Lightweight design, high capacity, long service life and economical production can be yours with Torrington Needle Bearings. Our engineers will be glad to help you adapt these compact anti-friction units to the requirements of your equipment. Write us today. THE TORRINGTON COMPANY, Torrington, Conn., or South Bend 21, Ind. District offices and Distributors in principal cities.



TORRINGTON *NEEDLE* **BEARINGS**

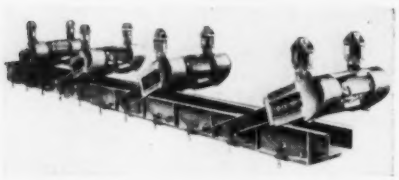
Needle • Spherical Roller • Tapered Roller Straight Roller • Ball • Needle Rollers

grinders, it is possible to get over 10,000 rpm, so that small mounted grinding wheels can be used at a much more satisfactory speed. Collets of ⅛ or ¼-inch fit the new handpiece. For carbide cutters, the No. 1300 handpiece is giving speeds up to 33,000 rpm. Any Wyco machine from ⅓ to 1½ hp can be modernized with this new attachment.

Check No. 15 on Reply Card for more Details

Vibratory Conveyors

Long vibratory conveyors in various lengths and capacities, for suspension or base mounting, are available from Syntron Co., 370 Lexington, Homer City, Pa. Powered by one or more Syntron vibratory motors



mounted either above or below the trough, depending upon available room, this type of conveyor is adaptable for the handling of extremely hot or abrasive materials. It may be built with sealed tubular troughs for the conveying of dusty or poisonous materials.

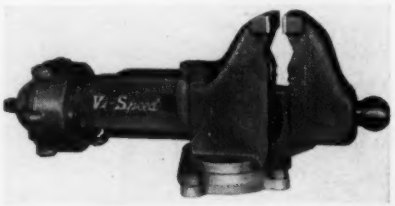
Conveyor has no belts, idlers or variable speed motors, movement of the trough being confined entirely to the spring system of the vibratory motor and a dial switch providing variable control of the rate of material flow. Unit illustrated is a heavy tonnage suspension type with an open flat pan trough, 20 feet long. It is equipped with gates located above each retort for charging as desired. •

Check No. 16 on Reply Card for more Details

Air-Powered Vises

Van Products Co., 1529 Erie Trust Bldg., Erie, Pa., is offering three new models of its Vi-Speed, air controlled vise. Actuated by an air cylinder, the device provides for a high speed repetitive operation and uses continuous air power to engage the jaws. Jaw actuation is by a foot pedal. Recommended minimum and maximum air line pressures are 15 and 150 lb, respectively, for all three models. Model 610-D has a maximum jaw opening of 10½-inches and air stroke of 1/64-inch minimum and 1-inch maximum. Its ratio to air line pressure is 100 times.

Model 1000 has a maximum jaw opening of 11-inches, a minimum and maximum air stroke of 1/64 and 1⅜-inches, respectively, and its pressure is 50 times that of the air line pressure. Model 1000-D has an 11-inch maximum opening and minimum and maximum air strokes of 1/64 and 1-inch. The pressure it is capable of applying is 100 times that of air line pressure. The latter two models have serrated and removable pipe jaws. The first mentioned has a stationary base while the latter two have swivel bases.



Check No. 17 on Reply Card for more Details

Preforming Press

Powdered metals, generator brushes made from carbon and copper mixtures, plastics and ceramic products may be preformed and molded in the

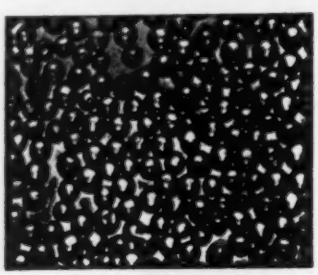
ACCEPTED
BY AMERICA'S LARGEST INDUSTRIAL PLANTS TO DO THE TOUGHEST BLASTING AND PEENING OPERATIONS

HI-GRADE METALLIC

FAMOUS
FOR ITS ABILITY TO STAND UP UNDER REPEATED HARD USE

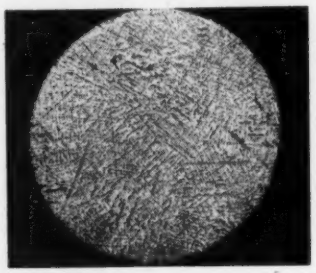
SHOT
- ROUND
- UNIFORM IN SIZE
- UNIFORM IN HARDNESS
- LACKS IRREGULAR SHAPES

GRIT
- RECTANGULAR
- SHARP
- TOUGH
- DURABLE



UNRETOUCHED PHOTO OF HI-GRADE SHOT

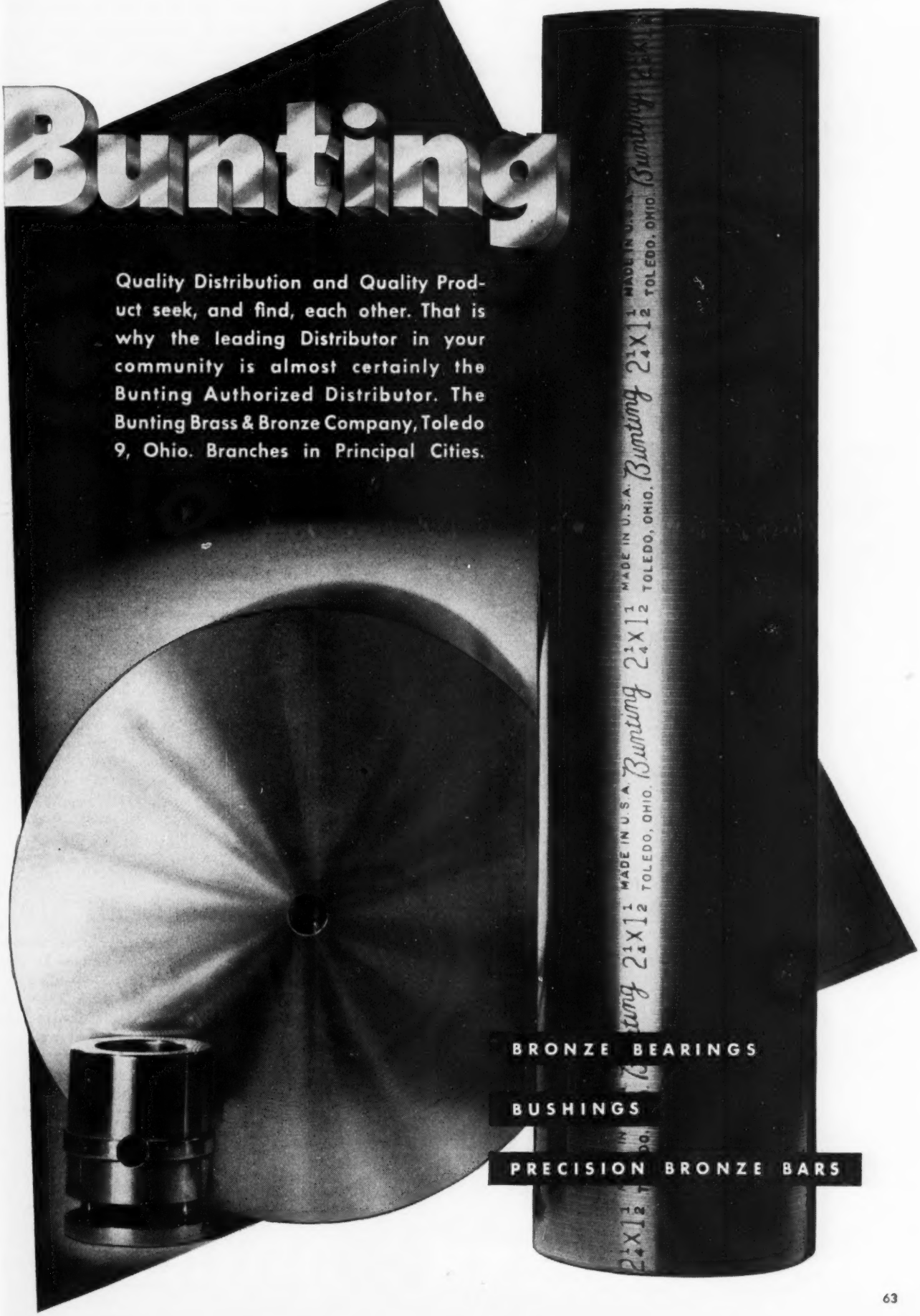
CLAYTON-SHERMAN ABRASIVES COMPANY
3896 LONYO ROAD
DETROIT 10, MICHIGAN
CEdar 7200



MICROSCOPIC STRUCTURE OF METAL

Bunting

Quality Distribution and Quality Product seek, and find, each other. That is why the leading Distributor in your community is almost certainly the Bunting Authorized Distributor. The Bunting Brass & Bronze Company, Toledo 9, Ohio. Branches in Principal Cities.



BRONZE BEARINGS

BUSHINGS

PRECISION BRONZE BARS

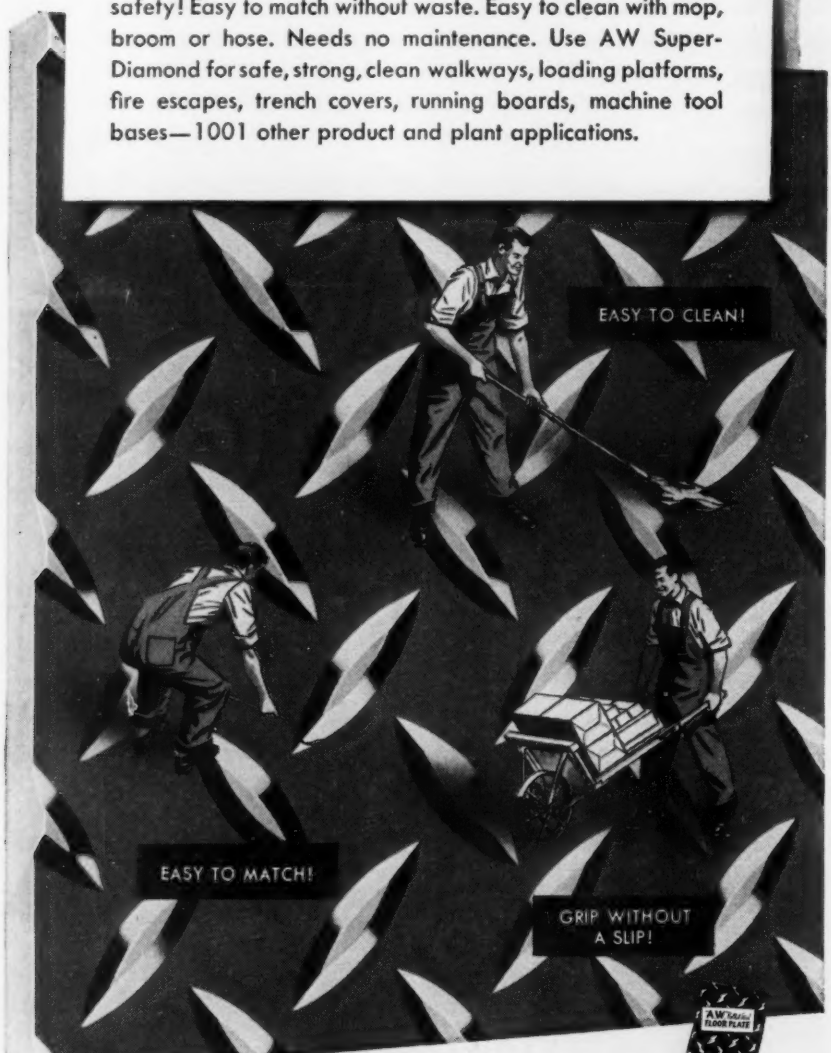
63

No More Slipping Accidents!

AW SUPER-DIAMOND FLOOR PLATE

A Better Footing for Product and Plant

Put this floor plate in your plant—or on your product—and say goodbye to costly slipping accidents. Even when the surface is wet or oily, exclusive engineered design with Super-Diamonds at 45° angles gives grip-without-a-slip safety! Easy to match without waste. Easy to clean with mop, broom or hose. Needs no maintenance. Use AW Super-Diamond for safe, strong, clean walkways, loading platforms, fire escapes, trench covers, running boards, machine tool bases—1001 other product and plant applications.



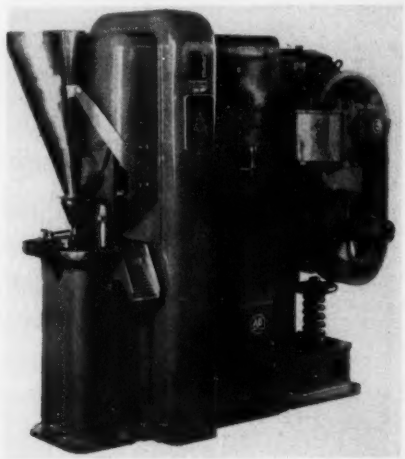
FREE *16-page Catalog L-29 crammed with valuable information. Write now.*

AW SUPER-DIAMOND
FLOOR PLATES THAT GRIP

A Product of ALAN WOOD STEEL COMPANY
Conshohocken, Pa.

Other Products: Permaclad, Stainless Clad Steel • AW Super Grip, Abrasive Floor Plate • Billets • Plates • Sheets (alloy and special grades)

55-ton press introduced by Arthur Colton Co., 2600 E. Jefferson Ave., Detroit 7, Mich. Known as the series 55 press, it is capable of producing as many as 50 preforms a minute and is designed primarily for making round and odd shapes, plain or with cored holes, having up to 3-inch cell depth and 3½ inches in diameter. Dies up to 6 inches in diameter and



3¼ inches in thickness are provided for.

Press is powered by 7½ hp motor through a variable speed drive so that speeds can be high for small work or slow for work requiring greater die fill time. A conveniently located lever operates a multiple disk clutch and also a brake which instantly stops the press at any part of the stroke. Power is transmitted to the crank shaft through a cone worm drive. Adjustments can be made to compensate for pressure, weight, hardness, thickness and for variation in core rod length. Various special attachments are available.

Check No. 18 on Reply Card for more Details

Spot Welder Control

Class 8992 electronic spot welder control, developed by Square D Co., 4041 N. Richards St., Milwaukee 12, Wis., include type NEMA type 3B timers and ignitron tube contractors for complete control of spot welders. The timer uses no sequencing relays and will operate at repeat speeds of over 400 welds per minute. The simple six tube circuit cancels out operating delays of valve and firing relays. Regulated direct current timing circuits insure accuracy for line voltage variations as great as plus or minus 10 per cent.

Firing relay operation is co-ordinated with alternating current line supply to give a consistent starting point for each weld and to insure full cycles of welding current. Timer can

We Take
OUR OWN MEDICINE

For a long time we've been prescribing modern mechanical equipment as the most effective means of cutting production costs while turning out better, more useful, more saleable merchandise.

The traveling housing, open side milling and boring machine in this picture—the largest machine of its kind—was recently installed in the Clearing plant at a cost exceeding a quarter-million dollars. With it, we save manhours while maintaining the extreme precision which, in turn, enables you to cut your costs when you use Clearing presses.

We take our own medicine because we believe no industry can succeed under today's conditions if it clings to yesterday's methods and machines. If you are producing metal products in quantity, we can show you some interesting facts that may help you improve your competitive position. Why not ask us?

CLEARING MACHINE CORPORATION
6499 West 65th Street • Chicago 38, Illinois

CLEARING PRESSES

CMC CLEARING

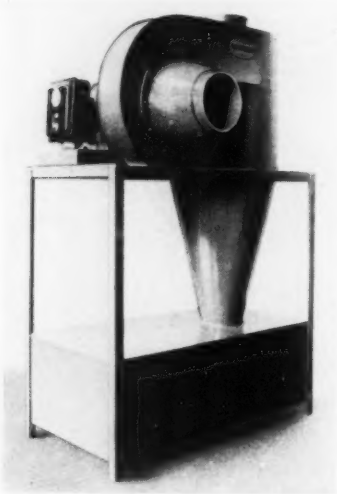
THE WAY TO EFFICIENT MASS PRODUCTION

be connected for either common or separate control supply of 115, 220 or 460, 50 or 60 cycles. The separate contactor panel accommodates sizes A, B or C ignitron tubes. Tubes are plainly visible with the enclosure door open, permitting a visual sequencing check.

Check No. 19 on Reply Card for more Details

Dust Collector

Dust and dirt or toxic fumes may be handled separately or in combination with various types of cutting, grinding and other machining with the model 2ON30 Dustkop filterless dust collector, made by Aget-Detroit Co., Ann Arbor, Mich. There is a



direct connection from the outlet of the cyclone separator to the outside.

To facilitate installation, units are available with a variety of standard sized inlets. Optional sizes include single 7-inch, single 6-inch, double 5-inch or triple 4-inch. Dust and dirt drawn in from the source is removed from the air stream by the cyclone separator and deposited in the removable drawer in the dust bin. Ratings, based on instrument test rather than fan tables, are: Volume, 2300 cfm, with 8600 fpm velocity and 4.5-inch static suction, all figured on 7-inch pipe.

Check No. 20 on Reply Card for more Details

• • •

VALVE: Belco Industrial Equipment Division Inc., Paterson 3, N. J., announces a new Multiport valve that eliminates rubbing rotor, high pressure loss and sticking plugs. Operation is free from water hammer and requires a single 1/20-horsepower motor.

Check No. 21 on Reply Card for more Details

CHISEL MORTISER: A portable electric chisel mortiser, offered by S. Wolf & Co. Ltd., London, England, may be used as a bench drill and a hand drill. Also when used with a bench clamp stand it is a bench grinder. Steel drilling capacity is 5/16-inch diameter. Speed on full load is 800 rpm, 110-120 v universal alternating current, direct current.

Check No. 22 on Reply Card for more Details

WATER DEMINERALIZER: In the new line of water demineralizers introduced by Industrial Filter & Pump Mfg. Co., Chicago 12, Ill., the dissolved mineral salts in the water are removed by a simple chemical action and absorption in passing the water through beds of ion exchange resins.

Check No. 23 on Reply Card for more Details

LAMP HOLDER: A new cast aluminum lamp holder for PAR-38 and R-40 lamps is announced by Steber Mfg., Broadview (Maywood), Ill. The line consists of three basic units—lamp holder, an adapter box for a cluster of up to five holder units and a pole slip-fitter for use on either a 1½ or 2 inch pipe.

Check No. 24 on Reply Card for more Details

MOTOR: Designed to drive hermetically sealed refrigerator compressors, a small-diameter motor is announced by General Electric's Fractional Horsepower Motor Division, Schenectady 5, N. Y. With a diameter of 4.790-4.792 inches, it is available in ratings up to 1/8 hp, 1725 rpm, 115 v, 60 cycles.

Check No. 25 on Reply Card for more Details

TIMER: Type DB timer for the automatic timing of continuous processing work where the various process periods bear a percentage relationship to total time cycle is introduced by Struthers-Dunn Inc., Philadelphia 7, Pa.

Check No. 26 on Reply Card for more Details

ATTENUATOR: A new V. U. meter multiplier, measuring 1¾ inches in diameter, is offered by Shallcross Mfg. Co., Collingdale, Pa. Two standard attenuation ranges are available.

Check No. 27 on Reply Card for more Details

EXHAUST VALVE: In operation of the QE 500 quick exhaust valve the fluid pressure automatically opens exhaust port to atmosphere when the main control valve is returned to normal position in a line close to the cylinder. Valving action is operated by fluid through two poppet elements. Valve is offered by Airmatic Valve Inc., Cleveland, O., in five standard pipe sizes—¼, ⅜, ½, ¾ and 1 inch.

Check No. 28 on Reply Card for more Details

GROUNDING BOX: Wiremold Co., Hartford 10, Conn., announces No. 5738F grounding box for fluorescent fixtures. The box accepts both 500 and 700 Wiremold and in addition to serving as a means for grounding the raceway, provides a suitable means for protecting splices coming in contact with combustible materials.

Check No. 29 on Reply Card for more Details

BAKING ENAMELS: A new line of baking synthetic enamels based on urea alkyds, vinyls and highly specialized resins, is offered by Organic Coatings Division of United Chromium Inc., New York 17, N. Y. Enamels are stocked in white, tinted whites and black and may be obtained in special colors on order.

Check No. 30 on Reply Card for more Details

RELAYS: Durakool Inc., Elkhart, Ind., announces a line of "hydrogen arc-quenched" mercury type relays. Made in single or multiple units, they are suitable for switching of heavy loads in practically all fields, including highly inductive circuits such as solenoids and motors.

Check No. 31 on Reply Card for more Details

V-BELT CLUTCHES: Model AN V-belt clutches, designed especially for fractional to 2 hp gasoline engines and electric motors, are announced by V-Belt Clutch Co., Los Angeles 5, Calif. This model features a pulley with a 2 5/16-inch outside diameter for A belt drives.

Check No. 32 on Reply Card for more Details

ELECTRODE: American Agile Corp., Cleveland, O., announces a new improved Blue-Red electrode. It meets AWS-E 6013 classification and is a general purpose all-position welding electrode. It operates with alternating or direct current.

Check No. 33 on Reply Card for more Details

INDEX FEED: An automatic dial index feed for punch presses is offered by de Castro & Associates, Huntington Park, Calif. Designated as Speedex, the standard table is 12 inches in diameter with larger tables available on special order.

Check No. 34 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

STEEL sellers appear to be in a highly mercurial frame of mind, blowing hot one week and cold the next in their appraisal of business prospects. Current thinking is noticeably on the downside, whereas only a week ago many market authorities had sensed a leveling off in the downtrend in steel demand under way since late last year. Products are in increasingly freer supply, and with steel production booming along at record pace pressure for price reductions is mounting and premium prices are rapidly disappearing with the return of competitive market conditions.

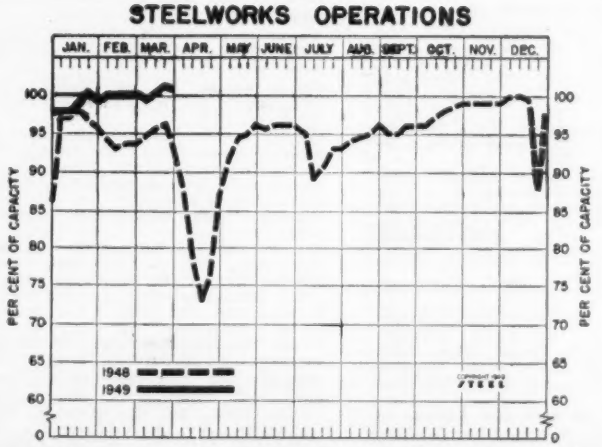
SUPPLY-DEMAND BALANCE— Predictions now are being freely made that supply-demand balance will be struck in many of the major steel products before end of second quarter. Up to last week or so, most steel authorities seemed to think it would be midyear at earliest before such balance would be experienced, and some of them were of the opinion it would be much later. However, alloys and specialties have been surplus for some time past, and, at the moment, supply appears to be rapidily catching up with demand for such major items as wire, sheets, shapes and plates.

OUTLOOK— Steelmakers would not be surprised if the downtrend in business continued for some weeks though few expect a sharp drop from present high levels. Many think April developments will tell the story for the remainder of the year. Meanwhile, manufacturing operations are contracting and unemployment is highest since early in the war though total employment, in excess of 57 million, tops anything experienced prewar. Government labor experts think employment will recover to around 60 million by July, basing their views on an anticipated spring surge in business. At the moment the outlook is confused with industry views mixed.

DEMAND— Noticeable drop in consumer requirements has accompanied slowing down in manufacturing. The gray market has just about disappeared and conversion deals are fading. Buyers are highly inventory conscious and are limiting orders. Many of them, only recently frantic shoppers for tonnage, are not interested in mill offerings. Termination of various conversion deals and slack demand for alloys and specialties have noticeably affected steelmaking operations at some plants, last week a number of openhearths and electric furnaces going out of production. The easing in demand has affected virtually all products, including certain flat-rolled items which long have been in acute supply.

PRICES— Except for plates, premium prices on the various steel products are rapidly disappearing. Last week the Kaiser Co. effected reductions ranging from $10 to $39 per ton on products produced at the Fontana, Calif. plant. This brought Kaiser's prices more in line with those quoted by other West Coast sellers, and while in most cases still above the market average, on one or two products the Fontana quotations now are lower than those quoted by others. Reductions from premium levels also were effected by Pittsburgh Steel Co. and Northwestern Steel & Wire Co. Conversion ingot prices have been cut sharply, reflecting sagging demand in this area of the market, and downward adjustments have been made in galvanized steel product prices to reflect the cut of 1.50c per pound effected in zinc last week. Otherwise steel prices are holding at established levels and leading producers have not yet given any sign they are contemplating any early change. Extra revisions continue to be announced, last week Inland Steel Co. putting a new schedule on sheets into effect, the most important revision tonnage-wise applying to pickling extras on hot-rolled.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended March 26	Change	Same Week 1948	Same Week 1947
Pittsburgh	99	None	95	99
Chicago	101	+ 0.5	95	94.5
Eastern Pa.	95.5	— 2.5	84	90.5
Youngstown	101	— 4	98	91
Wheeling	96.5	None	92.5	93.5
Cleveland	106	+ 0.5	94.5	94
Buffalo	104	None	85	90.5
Birmingham	100	None	97.5	99
New England	89	+ 2	77	94
Cincinnati	103	None	96	87
St. Louis	82.5	— 7	77.5	75
Detroit	111	+ 7	104	90
Western	97	— 2	..	..
Estimated national rate	101	— 0.5	93	97

Based on weekly steelmaking capacity of 1,845,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Mar. 26	Mar. 19	Month Ago Feb. 1949	Year Ago Mar. 1948	5 Years Ago Mar. 1944
Finished Steel	$97.23	$97.32	$97.77	$81.14	$56.73
Semifinished Steel	71.35	75.75	75.75	68.72	36.00
Steelmaking Pig Iron	46.22	46.22	46.22	39.34	23.00
Steelmaking Scrap	33.66	35.33	38.48	40.21	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Feb. 1949	4.20580c
Jan. 1949	4.20580c
Dec. 1948	4.20208c
Feb. 1948	3.54374c
Feb. 1944	2.38787c

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods, on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. January and February, 1949, figures are preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	Mar. 26, 1949	Feb. 1949	Dec. 1948	Mar. 1948
Steel bars, Pittsburgh mills	3.45c	3.45c	3.45c	2.90c
Steel bars, del. Philadelphia	3.8164	3.8164	3.79	3.356
Steel bars, Chicago mills	3.35	3.35	3.35	2.90
Shapes, Pittsburgh mills	3.275	3.275	3.275	2.80
Shapes, Chicago mills	3.25	3.25	3.25	2.80
Shapes, del. Philadelphia	3.4918	3.48	3.48	2.968
Plates, Pittsburgh mills	3.50	3.50	3.50	2.95
Plates, Chicago mills	3.40	3.40	3.40	2.95
Plates, del. Philadelphia	3.7256	3.7256	3.71	3.19
Sheets, hot-rolled, Pittsburgh mills	3.275	3.275	3.275	2.80
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	3.95
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	2.80
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	3.95
Strip, hot-rolled, Pittsburgh mills	3.275	3.275	3.275	3.05
Strip, cold-rolled, Pittsburgh mills	4.375	4.375	4.375	3.80
Bright basic, wire, Pittsburgh	4.325	4.325	4.325	3.775
Wire nails, Pittsburgh mills	5.775	5.775	5.775	5.20
Tin plate, per base box, Pitts. dist.	$7.75†	$7.75†	$6.80	$6.80

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$67.00*	$60.00
Slabs, Chicago	52.00	52.00	52.00	45.00
Rerolling billets, Pittsburgh	59.00	59.00	59.00	45.00
Wire rod $\frac{7}{32}$ to $\frac{1}{4}$-inch, Pitts. dist.	3.775c	3.775c	3.775c	3.175c

* Nominal. † 1.50 lb coating.

Pig Iron

	Mar. 26, 1949	Feb. 1949	Dec. 1948	Mar. 1948
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$48.08	$40.996
Basic, Valley	46.00	46.00	46.00	39.00
Basic, eastern, del. Philadelphia	50.3002	50.3002	50.17	42.004
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	40.496
No. 2 fdry., del. Philadelphia	50.8002	50.8002	50.67	42.504
No. 2 foundry, Chicago	46.25	46.25	46.25	39.00
No. 2 foundry, Valley	46.50	46.50	46.50	39.50
Southern No. 2 Birmingham	43.38	43.38	43.38	37.88
Southern No. 2 del. Cincinnati	49.43	49.43	49.09	41.857
Malleable, Valley	46.50	46.50	46.50	39.50
Malleable, Chicago	46.50	46.50	46.50	39.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	55.00
Ferromanganese, f.o.b. Etna, Pa.	175.00	163.00	163.00	151.00*

* F.o.b. cars Pittsburgh.

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$36.00	$40.00	$42.75	$40.25
Heavy melt. steel, No. 2, E. Pa.	26.50	35.69	41.50	39.00
Heavy melt. steel, No. 1, Chicago	33.50	35.75	41.75	38.875
Heavy melt. steel, No. 1, Valley	37.25	37.75	42.75	40.25
Heavy melt. steel, No. 1, Cleveland	35.25	37.25	42.25	39.75
Heavy melt. steel, No. 1, Buffalo	35.25	40.50	48.50	44.00
Rails for rerolling, Chicago	42.50	48.19	70.38	49.625
No. 1 cast, Chicago	37.00	44.25	70.50	66.00

Coke

Connellsville, beehive furnace	$14.50	$14.50	$14.50	$12.50
Connellsville, beehive foundry	17.00	17.00	17.00	14.875
Chicago, oven foundry, ovens	20.40	20.40	20.40	19.25

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $90-$95 per gross ton. Forging quality, $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except: $62, Conshohocken, Pa.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $68, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill except: $70, Conshohocken, Pa.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $90 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & $\frac{5}{16}$-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Portsmouth, O., Los Angeles; 4.15c Monessen, Pa. Basic open-hearth and bessemer, not resulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.55c, Ecorse, Mich., Pittsburgh, Aliquippa, Pa.; 4.00c Fontana, Calif.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif.; Portland, Oreg., Seattle; 4.20c, Kansas City, Mo.; 4.25c, Minnequa, Colo.; 4.40c, Atlanta.

Rail Steel Bars: (Base 10 tons): 3.35c, Moline, Ill., 5.10c, Williamsport, Pa.; another interest quotes 5.35c, mill.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 5.50c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.50c, Camden, N. J.; 5.30c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except 5.30c, Youngstown; 5.40c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Atlanta, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 4.65c, Williamsport, Pa., mill; another interest quotes 5.35c, mill.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.25-3.30c, Cleveland; 3.30c, Pittsburgh; 3.45c, Ecorse, Mich.; 3.95c, Pittsburgh, Torrance, Calif.; 4.15c, Fontana, Calif.; 5.00c, Conshohocken, Pa.; 6.25c, Kansas City, Mo.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 4.65c, Niles, O.; 5.05c, Torrance, Calif., Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich., Granite City, Ill.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 5.00c, Niles, O.; 5.15c, Pittsburg, Torrance, Calif.; 5.30c, Kokomo, Ind.

Galvannealed Sheets: 4.95c, mill, except: 5.05c, Indiana Harbor, Ind.; 5.55c, Niles, O.; 5.70c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill.; 5.45c, Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.; 6.00c, Niles, O.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.95c, Warren, O.; 6.05c, Niles, O.
Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren, O.; 6.55c, Niles, O.
Motor: 6.70c mill, except: 6.90c, Granite City, Ill.; 7.20c, Warren, O.
Dynamo: 7.50c, mill, except: 7.70c, Granite City, Ill.
Transformer 72, 8.05c, mill, except: 9.15c, Follansbee, W. Va., Toronto, O.; 10.05c, Brackenridge, Pa.; 65, 8.60c, mill, except: 9.85c, Follansbee, W. Va., Toronto, O.; 10.60c, Brackenridge, Pa.; 58, 9.30c, mill, except: 10.55c, Follansbee, W. Va., Toronto, O.; 11.30c, Brackenridge, Pa.; 52, 10.10c, mill, except: 11.35c, Follansbee, W. Va., Toronto, O.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 5.25c, Ecorse, Mich., and Conshohocken, Pa., mills. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.30c, Cleveland, Pittsburgh, Riverdale, Ill.; 3.25-3.35c,* Sharon, Pa.; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.65c, Atlanta; 3.70c, West Leechburg, Pa.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, S. San Francisco, Los Angeles; 4.20c, Kansas City, Mo.; 4.30c, Minnequa, Colo.; 5.90c Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

* Wider than 6-in. and 6-in. and narrower, respectively.

Cold-Rolled Strip (0.25 carbon and less): 4.00c, mill, except 4.00-4.25c, Warren, O.; 4.00-4.50c, Youngstown; 4.20c, Ecorse, Mich.; 4.25c, Riverdale, Ill.; 4.40-4.50c, Detroit; 4.50c, New Haven, Conn., West Leechburg, New Castle, Pa., Boston; 4.75c, Dover, O., New Kensington, Pa.; 4.50-5.00c, Trenton, N. J.; 4.80-5.05c, Wallingford, Conn.; 5.75c, Los Angeles; 7.10c, Fontana, Calif. One company quotes 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.50c, New Castle, Pa., Boston, Youngstown; 4.75c, Wallingford, Conn. Over 0.40 to 0.60 C, 5.50c, mill, except: 5.65c, Chicago; 5.75c, Dover, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston; 6.00c, New Castle, Pa. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton, N. J.; 6.60c, New Castle, Pa. Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.30c, Wallingford, Conn.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse, Mich., mill.

Tin, Terne Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-$7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $6.45-$6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

Holloware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala., Sparrows Point, Md.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $15.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md., Johnstown, Pa., Lackawanna, N. Y.; 3.60c, Pittsburgh; 3.65c, Ecorse, Mich.; 3.75c, Coatesville, Pa.; 3.95c, Claymont, Del., Conshohocken, Pa.; 4.30c, Seattle, Minnequa, Colo.; 4.56c, Houston, Tex.; 5.80c, Fontana, Calif.; 6.50c, Harrisburg, Pa.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.10c, Coatesville, Pa.; 5.30c, Conshohocken, Pa., Sparrows Point, Md., Johnstown, Pa.; 5.40c, Youngstown; 5.65c, Ecorse, Mich., Sharon, Pa.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, Aliquippa, Pa.; 3.85c, Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, S. San Francisco, Los Angeles; 5.75c, Fontana, Calif.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 5.15c, Youngstown.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Minnequa, Colo., Atlanta, Buffalo; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, S. San Francisco; 5.40c, Shelton, Conn. One producer quotes 4.15c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham

Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O.; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo.; 5.20c, Atlanta; 5.75c, S. San Francisco, Pittsburg, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 5.20c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O.; 5.40c, Aliquippa; 5.55c, Worcester, Mass.; 5.60c, Minnequa, Colo.; 5.65c, Atlanta; 6.20c, Pittsburg, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O.; 109, Worcester, Mass.; 110, Minnequa, Colo., Atlanta; 123, Pittsburg, Calif.; 124, Cleveland. One producer quotes column 103, Chicago and Pittsburgh base; another, column 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Col. 109, mill, except: 111, Portsmouth, O., Kokomo, Ind.; 116, Minnequa, Colo.; 121, Atlanta; 132, Pittsburg, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another, Col. 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Col. 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O.; 126 Atlanta; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base.

Fence Posts (with clamps): Col. 114, Duluth; 115, Johnstown, Pa.; 116, Moline, Ill.; 122, Minnequa, Colo.; $123.50 per net ton, Williamsport, Pa.

Bale Ties (single loop): Col. 106, mill, except: 108, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O.; 110, Atlanta; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes Col. 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Stainless Steels

(Mill prices, cents per pound)

CHROMIUM NICKEL STEELS

Type No.	Bars, Wire Shapes	Strip, Cold-Rolled	Sheets
301	28.50-28.75	30.50-32.00	37.50-40.75
302	28.50-28.75	33.00-33.75	37.50-40.75
303	31.00-31.50	36.50-39.75	39.50-43.00
304	30.00-31.25	35.00-35.75	39.50-43.00
316	46.00-48.00	55.00-57.25	53.00-57.25
321	34.00-34.75	44.50-45.75	45.50-49.00
347	38.50-39.75	48.50-50.25	50.00-54.00

STRAIGHT CHROMIUM STEELS

410	22.75-23.00	26.50-27.00	32.00-33.00
416	23.25-23.50	28.25-33.50	32.50-33.50
430	23.25-23.50	27.00-27.50	34.75-35.50
446	32.50-33.00	60.00-62.25	46.50-50.00

STAINLESS-CLAD STEELS

	Plates —Cladding— 10%	Plates —Cladding— 20%	Sheets —Cladding— 10%	Sheets —Cladding— 20%
302	....	....	19.75	21.50
304	22.50	26.50	20.75	22.50
310	32.50	36.50	....	....
316	27.00	31.00	26.00	28.00
321	23.50	27.50	....	....
347	25.00	29.00	24.00	26.00
405	18.75	24.75	....	....
410	18.25	24.25	....	....
430	18.25	24.25	....	....

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.50c
18	4	3	...	...	114.50c
18	4	2	...	9	168.50c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton. Discounts from base follow:

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	39½–	8½–	1	46–	25–
	41½	12½		48½	27½
¼	37½–	9½–	1¼	46½–	25½–
	39½	14		49	28
⅜	34–	4½–	1½	47–	26–
	36	9		49½	28½
½	40½–	18–	2	47½–	26½–
	43	21½		50	29
¾	43½–	22–	2½, 3	48–	27–
	46	24½		50½	29½
			3½ & 4	44½	22½

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	39½	17½	38½	16½	27–	5–
					38½–	17
2½	42½–	20½–	41½	19½	32½–	10½–
	43½	21½			41½	20
3	42½–	20½–	41½	19½	35–	13–
	43½	21½			41½	20
3½&4	42½–	20½–	43½	21½	38½–	16½–
	46½	24½			43½	22
5 & 6	42½–	20½–	43½	21½	38½–	16½–
	44½	22½			43½	22
7	....	....	....	....	43½	20½

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	40½	....	1¼	46–	26–
¼	38½	....		48	27
⅜	35	....	1½	46½–	26½–
½	40–	18½–		48½	27½
	42	19½	2	47–	26½–
¾	43–	22½–		49	28
	45	23½	2½ & 3	47½–	27–
1	45½–	25½–		49½	28½
	47½	26½	3½ & 4	43½	....

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	38½	16½	37½	15½	26–	4–
					37½	16
2½	42½	20½	40½	19½	31½–	9½–
					40½	19
3	42½	20½	40½	19½	34–	12–
					40½	19
3½-4	41½–	20–	42½	20½	37½–	15½–
	45½	23½			42½	21
5 & 6	41½–	20	42½	20½	37½–	15½–
	43½				42½	21
8	45½	....	44½	21½–	40½–	17½–
				22	44½	22
10	45	....	44	21–	41½–	18½–
				21½	44	21½
12	44	....	43	20	40½–	17½–
					43	20½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Lap Weld Blk.	Lap Weld Gal.
⅜	+59½	+95½	1¼	+22	+53
½	+20½	+52½	1½	+15½	+45½
¾	+10½	+41½	2	+ 7½	+36½
1 and			2½-3½	+ 5	+32
1¼	+ 4½	+32½	4	List	+26
1½	— 1½	+29	4½-8	+ 2	+27½
2	— 2	+28½	9-12	+12	+37

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	.....	13.39-14.64	13.00	13.00
1¼	13	.....	15.87-17.34	13.21	15.39
1½	13	16.45	17.71-19.35	14.60	17.18
1¾	13	18.71	20.15-22.02	16.60	19.54
2	13	20.96	22.56-24.66	18.60	21.89
2¼	13	23.36	25.16-27.50	20.73	24.40
2¼	12	23.54-25.73	27.70-30.28	22.83	26.88
2½	12	25.79-28.19	30.33-33.15	25.02	29.41
2¾	12	27.33-29.87	32.14-35.13	26.51	31.18
3	12	28.68-31.35	33.76-36.90	27.82	32.74
3¼	11	33.39-36.50	39.29-42.95	32.39	38.11
3½	11	35.85-39.19	42.20-46.13	34.78	40.94
4	10	44.51-48.65	52.35-57.22	43.17	50.78
4½	9	58.99-64.47	69.42-75.88	....	....
5	9	68.28-74.64	80.35-87.82	....	....
6	7	104.82-114.57	123.33-134.81	....	....

Pipe Cast Iron: Class B, 6-in. and over, $98.50 per net ton, Birmingham; $106.70, del. Chicago; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb mill, except: $3.50, Indiana Harbor, Ind., and Minnequa, Colo.

Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.

Light (rail steel): $5.10 per 100 lb, Williamsport, Pa.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Torrance, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes, 5.35c, mill.

Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del.	....	52.634	53.134	....
Philadelphia, del.	50.3002	50.8002	51.3002	51.8002
Birmingham, furnace	42.88	43.38	....	....
Cincinnati, del.	....	49.43	....	....
Buffalo, furnace	47.00	47.00	47.50	48.00
Boston, del.	56.20	56.20	56.70	....
Rochester, del.	49.35	49.35	49.85	50.35
Syracuse, del.	50.2065	50.2065	50.7065	41.2065
§**Chicago,** district furnaces	46.00	46.00-46.50	46.50	47.00
Milwaukee, del.	47.82	47.82-48.32	48.32	48.82
Muskegon, Mich., del.	....	51.28-51.78	51.78	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.3002	48.8002	48.8002	49.3002
Lone Star, Tex., furnace	50.00	†50.50	....	....
Duluth, furnace	....	46.50	46.50	47.00
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace	....	52.75	53.25	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.0578	....	....
Portland, Oreg., del.	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	49.40	49.90	50.40	....
Ironton, Utah, furnace	55.00	55.50	....	....
‡**Neville Island, Pa.,** furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	....	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Struthers, O., furnace	46.00	....	....	....
Swedeland, Pa., furnace	50.00	50.50	51.00	....
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	50.8230	51.3230	....	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.1022	50.6022	50.6022	51.1022

† Low phosphorus southern grade.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaca; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.

§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base) .$59.50
6.51-7.00.. 60.75 9.01- 9.50. 67.00
7.01-7.50.. 62.00 9.51-10.00. 68.25
7.51-8.00.. 63.25 10.01-10.50. 69.50
8.01-8.50.. 64.50 10.51-11.00. 70.75
8.51-9.00.. 65.75 11.01-11.50. 72.00
F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $84.75 furnace, Niagara Falls; $84 open-hearth and $85 foundry grade, Keokuk, Iowa. **Pigiets,** Si 16%, $91, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.45% max. P.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. F.o.b. furnace, Lyles, Tenn....$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Troy, N. Y., $54; Philadelphia, $56.9786 del. Intermediate phosphorus, Central furnace, Cleveland, $51.

Electrodes

(Threaded, with nipples, unboxed)

Diam. (Inches)	Length	Cents per lb. f.o.b. plant
	Graphite	
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
8	48, 60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24, 30	21.00
2	24, 30	23.00
	Carbon	
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens	
Connellsville, furnace	$13.50-15.50
Connellsville, foundry	16.00-18.00
New River, foundry	16.50
Wise county, foundry	15.35
Wise county, furnace	14.60
Oven Foundry Coke	
Kearney, N. J., ovens	$22.00
Everett, Mass., ovens. New England, del.‡	23.35
Chicago, ovens	20.40
Chicago, del.	†21.85
Detroit, del.	24.16
Terre Haute, ovens	20.20
Milwaukee, ovens	21.15
Indianapolis, ovens	20.85
Chicago, del.	24.19
Cincinnati, del.	23.66
Detroit, del.	24.61
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens	20.90
Buffalo, del.	23.42
Cleveland, del.	22.55
Erie, del.	22.70
Birmingham, ovens	17.70
Philadelphia, ovens	21.05
Swedeland, Pa., ovens.	21.00
Portsmouth, O., ovens.	19.50
Detroit, ovens	20.65
Detroit, del.	•21.70
Buffalo, del.	22.75
Flint, del.	22.98
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45. ‡ Or within $4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens
(Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	20.50-26.50
Toluol, two degrees	23.00-26.50
Industrial xylol	20.50-26.50
Per ton bulk, ovens	
Sulphate of ammonia	$45.00
Per pound, ovens (Effective as of Oct. 1)	
Phenol, 40 (carlots, returnable drums)	13.50
Do., less than carlots	14.25
Do., tank cars	12.50
(Effective as of Oct. 25)	
Naphthalene flakes, balls, bbl to jobbers, "household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hard-fired, $135 at above points.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Ahtens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Besemer, Ala., Ottawa, Ill., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa. $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅝" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibonsburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural)

Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% concentrates, contract	16.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	15.00
Brazil iron ore, 68-69%	19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26–$28

Manganese Ore

48-50%, duty paid, f.o.b. cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb, Mo., cont., Mines	$0.90

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Standard Structural Shapes	Carbon ⅜"-¾"	Floor ¾" & Thicker
New York (city)	6.00	6.66	7.40	5.92	...	5.77	6.56	8.68	5.53	5.90	7.36
New York(c'try)	5.80	6.46	7.20	5.72	...	5.57	6.36	8.48	5.33	5.70	7.16
Boston (city) ..	6.10	6.70	8.00	6.10	...	5.67	6.42	8.72	5.57	5.95	7.40
Boston (c'try) .	5.95	6.55	7.85	5.95	...	5.52	6.27	8.57	5.42	5.80	7.25
Phila. (city)...	5.72	6.64	7.53-7.58	5.60	...	5.55	6.34	8.40	5.25	5.53	6.74
Phila. (c'try)..	5.57	6.59	7.38-7.43	5.45	...	5.40	6.19	8.25	5.10	5.38	6.59
Balt. (city) ...	5.46†	6.36	7.26	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31†	6.21	7.11	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	5.84-6.00	...	...	5.90	...	5.91-5.95	6.61	...	5.85-5.89	6.05-6.09	7.50-7.54
Buffalo (del.)..	5.00	5.90	7.85	5.49	6.50	5.20	6.05	10.13	5.25	5.50	7.06
Buffalo (w'hse)	4.85	5.75	7.70	5.34	6.35	5.05	5.90	9.98	5.10	5.35	6.91
Pitts. (w'hse)..	4.85-4.90§	5.75[5]	7.15	5.00-5.10	6.00	4.90-5.10	5.65	9.60	4.90-5.15	5.05-5.25	6.55
Detroit (w'hse).	4.85-5.00§	5.75-5.85[5]	7.15	5.00-5.35	5.95-6.00	5.45	6.17	8.12	5.45	5.65-5.80	7.10
Cleveland (del.)	5.13-5.90‡‡	5.90-6.31	7.40-8.10‡‡	5.18-5.31	6.40-6.65	5.32-5.36	6.05	8.24-8.40	5.35-5.62	5.52-5.56	6.95-7.01
Cleve. (w'hse).	4.98-5.75	5.75-6.16	7.25-7.95	5.03-5.16	6.25-6.50	5.17-5.21	5.90	8.24-8.25	5.21-5.47	5.37-5.41	6.80-6.86
Cincin. (w'hse).	5.29	6.14	7.63	5.55	6.10	5.55	6.10	...	5.40	5.64	6.94
Chicago (city).	5.20	5.90‡[5]	7.30	5.00	6.67-6.80	5.05	5.85	8.25[9]	5.05	5.25	6.70
Chicago (w'hse)	4.85-5.05	5.75‡[5]	7.15	4.85	6.52-6.65	4.90	5.70	8.10[9]	4.90	5.10	6.55
Milwaukee(city)	5.38	6.08‡[5]	7.48	5.18	6.82-6.98	5.23	6.03	8.43[9]	5.23	5.43	6.88
St. Louis (del.)	5.34§	6.24[5]	7.44	5.34	6.64	5.39	6.19[12]	6.64	5.39	5.59	7.04
St. L. (w'hse).	5.19§	6.09[5]	7.29	5.19	6.49	5.24	6.04[12]	9.49	5.24	5.44	6.89
Birm'ham (city)	5.20§	...	6.60	5.20	...	5.15	6.66-6.83	...	5.15	5.40	7.41-7.73[20]
Birm'ham(c'try)	5.05§	...	6.45	5.05	...	5.00	6.51-6.68	...	5.00	5.25	7.26-7.58[20]
Omaha, Nebr...	6.07	...	9.33	6.07	...	6.12	6.92	...	6.12	6.32	7.77
Los Ang. (city)	6.60§	8.05	8.90†	6.80	9.50	6.25	8.20	...	6.10	6.30	8.20
L. A. (w'hse) .	6.45§	7.90	8.75†	6.65	9.35	6.10	8.05	...	5.95	6.15	8.05
San Francisco..	5.95[21]	7.15	8.05	6.75[21]	8.25[18]	5.90[21]	7.55	10.20‡‡	5.90	7.60	8.10
Seattle-Tacoma.	6.35[17]	7.90[5]	8.40	6.70[17]	...	6.20[17]	8.15[1]	9.45[3]	6.30[17]	6.35[17]	8.40[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [9]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [16]—2000 lb and over; [17]—300 to 999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb; [23]—Price (but not other price in range) applies to any and all quantities.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ top level of quoted range is nominal.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅞ and ⅝ x 6-in. and shorter	37 off
¾-in. and larger x 6-in. and shorter..	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. f.o.b. A.S. Reg. and Light	Heavy
⅞-in. and smaller	41 off	.....
½-in. and smaller	.....	38 off
⅝-in.-1-in.	39 off	.....
⅞-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	34 off	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	40 off
¾, ⅞, & 1 x 6-in. and shorter	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants

Structural ½-in. and larger	6.75c
⅞-in. and under	48 off

Washers, Wrought

F.o.b. shipping point, to jobbers..Net to $1 off

FERROALLOY PRODUCT PRICES

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $160 per gross ton of alloy, c.l., packed, $172; gross ton lots, packed, $187; less gross ton lots, packed, $204; f.o.b. *Alloy, W. Va., *Niagara Falls, N. Y., or Welland, Ont. Base Price: $165, Rockwood, Tenn.; $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $160, *Sheridan, Pa.; $163,* Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $31 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $201; less gross ton lots, $218 f.o.b. Chicago. Add or subtract $2 for each 1%, or fraction thereof, of contained manganese over 82% and under 78%, respectively.

* Contract price with spot $12 higher. Effective Apr. 1, contract price will be same as spot at Alloy, W. Va., Niagara Falls, N. Y., Welland, Ont., Sheridan, and Etna, Pa.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P. 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c, Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload, 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, F.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.6c per lb of alloy, carload packed, 9.35c, ton lot 10.25c, less ton 11.25c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 20.5c per lb of contained Cr; c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c- 28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

(*Please turn to Page* 154)

Price of Zinc Reduced 1.5c

New level established on basis of 16.0c, East St. Louis, for prime western grade. Volume of new orders reported light. Export business at standstill

New York—Downward tendencies in demand and prices continue to characterize the nonferrous metals markets.

Last week, prime western zinc was reduced 1.5c to basis of 16.0c, East St. Louis, with other grades lower at usual differentials. This is the first change since November, 1948, when a 17.5c market was established.

Although large consumers in the galvanizing and automobile die casting fields have continued to take substantial tonnages of zinc, the volume of new business is reported to be light, accounting for the quiet market of the last several weeks. Apparently many consumers have been intent on reducing inventories.

The export market has been practically at a standstill.

Zinc output from domestic mines in January totaled 52,914 net tons, a 4 per cent drop from the December, 1948, production of 55,141 tons, but 2 per cent greater than the average monthly rate during 1948, according to the U. S. Bureau of Mines.

Adopts New Lead Price Policy

New York—Reflecting lowered demand and resultant unstable price conditions in the lead market, American Smelting & Refining Co. will discontinue effective Apr. 1 its New York lead quotation.

The quotation has been used both for determining the price consumers pay for lead purchased from the company under continuing or average price contracts covering specified periods of time and for setting the price the company pays for ore and other lead-bearing materials.

Beginning Apr. 1, the company's contracts for purchase of ores and other lead-bearing materials will be based on quotations for lead at New York as determined by the *Engineering and Mining Journal*. This quotation or quotations appearing in other established trade sources will be used in determining prices under continuing or average price contracts covering the sale of lead.

Under the new policy, purchases of ores and materials by American Smelting & Refining will be based upon the sales of lead made by all sellers of the refined metal on an average level each day rather than on the basis of the company's sales alone.

Only in one previous period in the company's 50-year history has it not had an official quotation on lead at New York. The exception was in November and December, 1907, and the year 1908, when the New York lead price was based on the open market.

For some time, St. Joseph Lead Co. has based its average price contracts on quotations determined by the *Engineering and Mining Journal*.

As a result of decreased demand, the price of common lead has tumbled 3.5c in the last three weeks. After American Smelting & Refining lowered its quotation a second time and cut common grade 1.5c, making its price 18.0c per lb, New York, the St. Joseph Lead Co. fell in line and cut its price 1.5c, making its new quotation 17.8c, St. Louis.

Makers of lead goods have followed the reductions in the raw materials prices by lowering prices in products which use lead.

Despite the price cuts in lead, demand continues light. Last week, consumers' bookings of metal for April represented around 45 per cent of supplies, a level considerably below normal for that time of month.

Activity in lead scrap also continued light, with buyers of battery plates accepting only limited quantities.

U.S. Eases Tin Controls

Washington—Department of Commerce has modified its controls over uses of tin, as contained in its M-43 directive. The following are the major changes:

Increase is permitted in tin content of auto body solders, from 15 to 22 per cent.

Increase is permitted in tin content of collapsible tubes; for dentifrices, from 3 to 7½ per cent; for shaving creams, cosmetics and related products, from ½ to 3 per cent.

Tinning of flat copper-base wire is permitted for electrical connections, etc.

Tinning of steel wire is permitted for a number of uses, including food packaging, staple wiring in printing, etc.

Increases are permitted in tin content of lead base coating alloys.

Limit on tin content in copper-base alloys for certain uses has been removed.

Use of terne plate is permitted for home building construction purposes.

Limited use is permitted, on special authorization, of pig tin produced from low-grade secondary in production of stannous chloride and other chemicals.

The controls also now permit canmakers and others more latitude in using "idle and excess" hot dipped tin plate and menders.

Brass Mill Business Declines

New York—As a result of the decline in the brass mill industry's business, the amount of copper contained in products shipped from brass mills, wire mills, and foundries during February dropped 17,327 tons.

Products shipped from these plants last month had a copper content of 94,224 tons, compared with 111,551 tons in January. The February copper content tonnage was the lowest since June, 1946.

New orders to brass mills last month fell to 65,812 tons, compared with 96,594 tons in January. The February bookings were the smallest since February, 1946, when they amounted to 63,301 tons.

Unfilled orders at plants of copper and copper alloy product makers totaled 272,575 tons at the end of February, a decrease from the 300,987 tons at the end of January.

Brass, Bronze—Prices for brass and bronze ingots made from scrap metals have been reduced by 1.0c to 2.0c per pound by a leading maker of these ingots.

Since the beginning of this year, prices for brass and bronze ingots have been lowered a total of from 1.5c to 3.5c per pound, depending upon the grade.

Demand from foundries, the principal users of these ingots, has fallen off during the last several months. The ingot brass and bronze industry reported that February shipments of such products totaled 15,026 tons, compared with 19,456 tons in January. A year ago, February shipments totaled 22,487 tons and January deliveries, 26,998 tons.

Platinum—New price of platinum is $72 an ounce for large quantities and $75 for retail lots. These levels represent a reduction of $6 an ounce.

Since the beginning of the year, the platinum price has been lowered $21 an ounce, the quotation at the start of 1949 being $93 to $96. The latest cut is the fifth successive one this year.

Demand for platinum has been on a reduced scale for some months, and, according to industry members, the supply is greater than consumer requirements.

Sees Good Future for Copper

New York—Competition is expected to be increasingly keen in the metal industries this year but there is every reason for the copper industry to face the future with confidence, C. Donald Dallas, chairman, Revere Copper & Brass Inc., declared in a statement prepared for the annual report of the company.

Supply of major metals began to catch up with demand in 1948, he states, pointing out that this year copper fabricators will compete increasingly among themselves and may experience more competition from steel and aluminum if shortages of these metals are further corrected.

Price relationships between copper and steel are substantially the same as before the war, Mr. Dallas states. In aluminum the situation is different. Whereas before the war copper cost less than aluminum on a weight basis it is now about 40 per cent more expensive per pound. On a volume or cubic foot basis because of the different densities of the two metals copper is more than four times aluminum in cost. He added, however, too much significance should not be attached to these relationships since even before the war copper cost considerably more than aluminum on a cubic foot basis, and a good deal of the substitution that was based purely on price had already been made.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 23.50c, Conn. Valley; Lake, 23.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 18.00-20.00c; 88-10-2 (No. 215) 29.50c; 80-10-10 (No. 305) 25.25c; No. 1 yellow (No. 405) 15.00-17.00c.

Zinc: Prime western 16.00c, brass special 16.25c, intermediate 16.50c, East St. Louis; high grade 17.00c, delivered.

Lead: Common 17.80-17.85c, chemical and corroding 17.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloy (6-6 type) 20.50-21.00c; No. 12 foundry alloy (No. 2 grade) 19.75-20.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.50-22.00c; grade 2, 20.50-21.00c; grade 3, 19.50-20.00c; grade 4, 18.50-19.00c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $88-$94 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.10.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 71.50c per ounce.

Platinum: $72-$75 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 37.18; yellow brass 34.58; commercial bronze, 95%, 37.23; 90%, 36.88; red brass, 85%, 36.01; 80%, 35.66; best quality, 35.33; nickel silver, 18%, 46.92; phosphor-bronze, grade A, 5%, 56.05.

Rods: Copper, hot rolled 36.53; cold drawn 34.28; yellow brass, free cutting, 29.24; commercial bronze, 95% 36.92; 90% 36.57; red brass, 85% 35.70; 80% 35.35.

Seamless Tubing: Copper 37.22; yellow brass 37.59; commercial bronze 90% 39.54; red brass 85% 38.92; 80% 38.57.

Wire: Yellow brass 34.87; commercial bronze, 95% 37.52; 90% 37.17; red brass, 85% 36.30; 80% 35.95; best quality brass 35.62.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 29.42½c, l.c.l. 29.92-30.05c; weatherproof, f.o.b. eastern mills, c.l. 29.60-29.85c, l.c.l. 30.35c; magnet, delivered, c.l. 32.75-33.50c, 15,000 lb or more 33.00-33.75c, l.c.l. 33.50-34.25c.

ALUMINUM

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	—Hexagonal— R317-T4	17S-T4
0.125	48.0	...	...	
0.156-0.203	41.0	...	...	
0.219-0.313	38.0	...	...	
0.344	37.0	...	47.0	
0.375	36.5	45.5	44.0	
0.406	36.5	...	...	
0.438	36.5	45.5	44.0	
0.469	36.5	...	...	
0.500	36.5	45.5	44.0	
0.531	36.5	...	...	
0.563	36.5	...	41.5	
0.594	36.5	...	...	
0.625	36.5	43.0	41.5	
0.656	36.5	...	...	
0.688	36.5	...	41.5	
0.750-1.000	35.5	40.5	39.0	
1.063	35.5	...	37.5	
1.125-1.500	34.5	39.0	37.5	
1.563	34.5	...	37.5	
1.625	33.5	...	36.5	
1.688-2.000	33.5	...	...	
2.125-2.500	32.5	...	...	
2.625-3.375	31.5	...	...	

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $23.00 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft. Pipe: Full coils, $23.00 per cwt; cut coils, $23.00. Traps and Bends: List price plus 60%.

ZINC

Sheets, 22.00c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 20.75-21.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 19.75-20.50c; over 12-in., 20.75-21.50c.

NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c, Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb. 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 33.84c; oval 33.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 48.00c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,900 lb, 17.00c, f.o.b. Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices f.o.b Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 42.50c, f.o.b. Cleveland; 43.00c, Detroit; 42.00c, f.o.b. Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 97.00c; in 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.125	21.125	20.375
Yellow brass	18.875	18.625	18.125
Commercial Bronze			
95%	20.250	20.000	19.500
90%	20.125	19.875	19.375
Red Brass			
85%	20.000	19.750	19.250
80%	19.875	19.625	19.125
Best Quality (71-79%)	19.750	19.500	19.000
Muntz Metal	18.250	18.000	17.500
Nickel, silver, 10%	20.250	20.250	10.125
Phos. bronze, A	22.625	22.375	21.375
Naval brass	18.750	18.500	18.000
Manganese bronze	18.750	18.500	17.875

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, f.o.b. shipping joint, carload lots)

No. 1 copper 16.50, No. 2 copper 15.50, light copper 14.50, composition red brass 12.25-12.50, auto radiators 10.75, heavy yellow brass 9.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 17.00, No. 2 copper 16.00, light copper 15.00, refinery brass (60% copper), per dry copper content 14.25-15.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 15.50-15.75, No. 2 14.50-14.75, light copper 13.50-13.75, No. 1 composition red brass 10.75-11.00, No. 1 composition turnings 10.25-10.50, mixed brass turnings 7.75-8.00, new brass clippings 14.75-15.25; No. 1 brass rod turnings 9.00-9.25, light brass 6.50-6.75, heavy yellow brass 8.00-8.25, new brass rod ends 11.75-12.25, auto radiators, unsweated 9.25-9.50, cocks and faucets 9.50-9.75, brass pipe 9.75-10.00.

Lead: Heavy 10.50-11.00, battery plates 5.00-5.50, linotype and stereotype 12.00-12.50, electrotype 10.50-11.00, mixed babbitt 12.00-12.50, solder joints, 16.00-16.50.

Zinc: Old zinc 7.50-8.00, new die cast scrap 7.50-8.00, old die cast scrap 4.50-5.00.

Tin: No. 1 pewter 64.00-66.00, block tin pipe 82.00-83.00, No. 1 babbitt 48.00-50.00, siphon tops 49.00-51.00.

Aluminum: Clippings 2S 12.00-12.50, old sheets 8.00-8.50, crankcase 8.00-8.50, borings and turnings 4.00-4.50, pistons, free of struts, 8.00-8.50.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Feb. Avg.	23.50	21.235	17.50	103.00	17.00	38.50	40.00	70.838
Jan. Avg.	23.50	21.325	17.50	103.00	17.00	38.50	40.00	70.00
Mar. 1-7	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00	71.50
Mar. 8-12	23.50	19.30-19.35	17.50	103.00	17.00	38.50	40.00	71.50
Mar. 14-15	23.50	17.85-19.30	17.50	103.00	17.00	38.50	40.00	71.50
Mar. 16-22	23.50	17.80-17.85	17.50	103.00	17.00	38.50	40.00	71.50
Mar. 23-24	23.50	17.80-17.85	16.00	103.00	17.00	38.50	40.00	71.50

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Hvy. Melt	$36.00
No. 2 Hvy. Melt	34.00
No. 1 Busheling	36.00
No. 1 Bundles	36.00
No. 2 Bundles	32.00
No. 3 Bundles	30.00
Heavy Turnings	30.00-31.00
Machine Shop Turnings	24.50-25.00
Mixed Borings, Turnings	22.50-23.50*
Short Shovel Turnings	25.00
Cast Iron Borings	25.00-25.50
Bar Crops and Plate	39.50-40.00
Low Phos. Steel	39.50-40.00

Cast Iron Grades

Mixed Yard	35.50-36.50
No. 1 Machinery Cast	41.50-42.50
Charging Box Cast	37.00-38.00
Heavy Breakable Cast	34.00-35.00
Brake Shoe	37.00-38.00

Railroad Scrap

No. 1 R.R. Heavy Melt	38.00-40.00
Axles	44.00-46.00
Rails, Random Lengths	38.00-40.00*
Rails, 2 ft and under	45.00-46.00
Rails, 18 in. and under	46.00-47.00
Railroad Specialties	42.00-44.00
Angles, Splice Bars	41.00-42.00

* Brokers' buying prices.
† Nominal.

CLEVELAND

No. 1 Heavy Melt. Steel	$35.00-35.50
No. 2 Heavy Melt. Steel	31.50†
No. 1 Busheling	35.00-35.50
No. 2 Bundles	29.50†
Machine Shop Turnings	21.00†
Mixed Borings, Turnings	25.00-25.50
Short Shovel Turnings	25.00-25.50
Cast Iron Borings	25.00-25.50
Bar Crops and Plate	37.00-37.50
Punchings & Plate Scrap	37.00-37.50
Cut Structurals	39.50-40.00

Cast Iron Grades

No. 1 Cupola	42.00-44.00
Charging Box Cast	40.00-42.00
Stove Plate	38.00-40.00
Heavy Breakable Cast	34.00-35.00
Unstripped Motor Blocks	34.00-35.00
Malleable	38.00†
Brake Shoes	35.00-35.50
Clean Auto Cast	45.00-45.50
No. 1 Wheels	40.00-41.00
Burnt Cast	33.00-34.00

Railroad Scrap

No. 1 R.R. Heavy Melt	39.00-39.50
R.R. Malleable	38†
Rails, 3 ft and under	48.00-50.00
Rails, Random Lengths	42.00-44.00
Cast Steel	41.00-42.00
Railroad Specialties	41.00-42.00
Uncut Tires	40.00-42.00
Angles, Splice Bars	44.00-45.00

† Nominal.

VALLEY

No. 1 Heavy Melt. Steel	$37.00-37.50
No. 2 Heavy Melt. Steel	34.50-35.00
No. 1 Bundles	33.00
No. 2 Bundles	32.50-33.00
Machine Shop Turnings	21.00-23.00
Short Shovel Turnings	24.00-25.00
Cast Iron Borings	24.00-25.00
Low Phos.	40.00-41.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	39.50-40.00

MANSFIELD

Machine Shop Turnings	$25.00-25.50
Short Shovel Turnings	26.00-26.50

CINCINNATI

No. 1 Heavy Melt. Steel	$30.00
No. 2 Heavy Melt. Steel	30.00
No. 1 Busheling	30.00
Nos. 1 & 2 Bundles	30.00
Machine Shop Turnings	20.00
Mixed Borings, Turnings	20.00
Short Shovel Turnings	21.00
Cast Iron Borings	21.00

Cast Iron Grades

No. 1 Cupola Cast	42.00
Charging Box Cast	35.00
Heavy Breakable Cast	35.00
Stove Plate	35.00
Unstripped Motor Blocks	30.00
Brake Shoes	32.00
Clean Auto Cast	42.00
Drop Broken Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00
R.R. Malleable	35.00
Rails, Rerolling	43.00
Rails, Random Lengths	36.00
Rails, 18 in. and under	46.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 Bundles	$29.00-30.00
No. 2 Bundles	27.00-28.00
No. 2 Heavy Melt. Steel	27.00-28.00
No. 1 Busheling	29.00-30.00
Machine Shop Turnings	18.00-19.00
Mixed Borings, Turnings	19.00-20.00
Short Shovel Turnings	20.00-21.00
Cast Iron Borings	20.00-21.00
Punchings & Plate Scrap	32.00-33.00

Cast Iron Grades

No. 1 Cupola Cast	33.00-35.00
Heavy Breakable Cast	28.00-30.00
Clean Auto Cast	33.00-35.00

BUFFALO

No. 1 Heavy Melt. Steel	$35.00-35.50
No. 2 Heavy Melt. Steel	29.50-30.00
No. 1 Busheling	29.50-30.00
No. 1 Bundles	29.50-30.00
No. 2 Bundles	27.00-27.50
Machine Shop Turnings	21.50-22.00
Mixed Borings, Turnings	21.50-22.00
Cast Iron Borings	21.50-22.00
Short Shovel Turnings	23.00-24.00
Low Phos.	37.50-38.00

Cast Iron Grades

No. 1 Cupola	34.00-35.00
Mixed Cast	30.00-33.00
Heavy Breakable	31.00-32.00
Malleable	32.00-35.00
Clean Auto Cast	39.00-40.00

Railroad Scrap

Rails 3 ft. and under	45.00-46.00
Scrap rails	41.00-42.00
Railroad specialties	40.00-41.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$31.00-32.00
No. 2 Heavy Melt. Steel	26.00-27.00
No. 1 Busheling	26.00-27.00
No. 1 Bundles	31.00-32.00
No. 2 Bundles	23.50-24.50
Machine Shop Turnings	21.00
Mixed Borings, Turnings	17.00-18.00
Short Shovel Turnings	23.00-24.00
Bar Crop and Plate	37.00-38.00
Punchings & Plate Scrap	37.00-38.00
Cut Structurals	37.00-38.00
Elec. Furnace Bundles	34.00
Heavy Turnings	31.00-32.00
No. 1 Chemical Borings	nom.

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00
No. 1 Machinery Cast	38.00
Charging Box Cast	34.00
Heavy Breakable Cast	34.00
Unstripped Motor Blocks	33.50
Clean Auto Cast	35.00-36.00
No. 1 Wheels	38.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	22.00
No. 1 Busheling	21.00-22.00
No. 1 Bundles	25.00
No. 2 Bundles	18.00-20.00
No. 3 Bundles	nominal
Machine Shop Turnings	13.00-14.00
Mixed Borings, Turnings	13.00-14.00
Short Shovel Turnings	15.00-17.00
Punchings & Plate Scrap	25.00-27.00
Cut Structurals	nominal
Elec. Furnace Bundles	25.00-26.00

Cast Iron Grades

No. 1 Cupola Cast	27.00-28.00
No. 1 Machinery	30.00-31.00
Charging Box Cast	28.00-29.00
Heavy Breakable	28.00-29.00
Unstripped Motor Blocks	25.00-26.00
Malleable	nom.

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$26.00-27.00
No. 2 Heavy Melt. Steel	22.00-23.00
No. 1 Bundles	23.50-24.50
No. 1 Busheling	22.00-23.00
Machine Shop Turnings	16.50-17.50
Mixed Borings, Turnings	16.50-17.00
Short Shovel Turnings	21.00-22.00
Bar Crops and Plate	29.00-30.00
Punchings & Plate Scrap	29.00-30.00
Chemical Borings	26.00-27.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00
Heavy Breakable Cast	34.00-35.00
Stove Plate	30.00-32.00
Unstripped Motor Blocks	28.00-30.00
Clean Auto Cast	29.00-31.00

CHICAGO

No. 1 Heavy Melt. Steel	$32.00-35.00†
No. 2 Heavy Melt. Steel	30.00-31.00
No. 1 Bundles	31.00-35.00†
No. 2 Bundles	26.00-27.00
No. 3 Bundles	25.00-26.00
Machine Shop Turnings	21.00-22.00
Mixed Borings, Turnings	21.00-22.00
Short Shovel Turnings	21.00-22.00
Cast Iron Borings	21.00-22.00
Bar Crops and Plate	34.00-36.00
Punchings	34.00-36.00
Elec. Furnace Bundles	33.00-34.00
Heavy Turnings	30.00-31.00
Cut Structurals	35.00-36.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-38.00
Clean Auto Cast	36.00-38.00
No. 1 Wheels	36.00-38.00

Railroad Scrap

No. 1 R.R. Heavy Melt	35.00-36.00
Malleable	35.00-36.00
Rails, Rerolling	42.00-43.00
Rails, Random Lengths	37.00-38.00
Rails, 3 ft. and under	41.00-42.00
Rails, 18 in. and under	42.00-43.00
Railroad Specialties	40.50-41.50
Angles, Splice Bars	39.00-40.00

† Top price represents earmarked scrap.

ST. LOUIS

No. 1 Heavy Melt. Steel	$29.00-30.00
No. 2 Heavy Melt. Steel	29.00-30.00
Machine Shop Turnings	20.00-21.00
Short Shovel Turnings	20.00-21.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-38.00
Charging Box Cast	32.50
Heavy Breakable Cast	32.50
Brake Shoes	31.00-32.00
Clean Auto Cast	36.00-38.00
Burnt Cast	32.00-33.00

Railroad Scrap

R.R. Malleable	33.00-36.00
Rails, Rerolling	42.00-43.00
Rails, Random Lengths	34.00-35.00
Rails, 3 ft. and under	39.00-40.00
Uncut Tires	39.00-40.00
Angles, Splice Bars	38.00-39.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$29.00
No. 2 Heavy Melt. Steel	29.00
No. 1 Busheling	29.00
No. 2 Bundles	27.00
Long Turnings	24.00
Short Shovel Turnings	24.50
Cast Iron Borings	24.50
Bar Crops and Plate	35.00
Cut Structurals	36.00

Cast Iron Grades

No. 1 Cupola Cast	41.00-42.00
Stove Plate	38.00-39.00
No. 1 Wheels	39.00-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.50
R.R. Malleable	nominal
Rails, Rerolling	41.00-43.00
Rails, Random Lengths	38.00-40.00
Rails, 3 ft. and under	40.00-42.00
Angles and Splice Bars	40.00-42.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*23.00
No. 3 Bundles	*20.00
Machine Shop Turnings	*15.00
Bar Crops and Plate	*25.00
Cast Steel	*25.00
Alloy Free Turnings	*15.00
Cut Structurals	*25.00

Cast Iron Grades

No. 1 Cupola Cast	35.00

Railroad Scrap

No. 1 Heavy Melting	*26.00
Wheels	*29.50
Rails, Random Lengths	*26.50

*F.o.b. California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
No. 1 Busheling	22.50
Nos. 1 & 2 Bundles	23.00
No. 3 Bundles	20.00
Machine Shop Turnings	15.00-20.00
Mixed Borings, Turnings	15.00-20.00
Punchings & Plate Scrap	30.00-35.00
Cut Structurals	30.00-35.00

Cast Iron Grades

No. 1 Cupola Cast	30.00-35.00
Heavy Breakable Cast	25.00
Stove Plate	25.00-27.50
Unstripped Motor Blocks	25.00
Malleable	25.00
Brake Shoes	25.00
Clean Auto Cast	27.50
No. 1 Wheels	27.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	25.00
Railroad Malleable	25.00
Rails, Random Lengths	25.00
Angles and Splice Bars	22.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	23.00
No. 3 Bundles	20.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	33.00-36.00

Cast Iron Grades

No. 1 Cupola Cast	$30.00-35.00

HAMILTON, ONT.

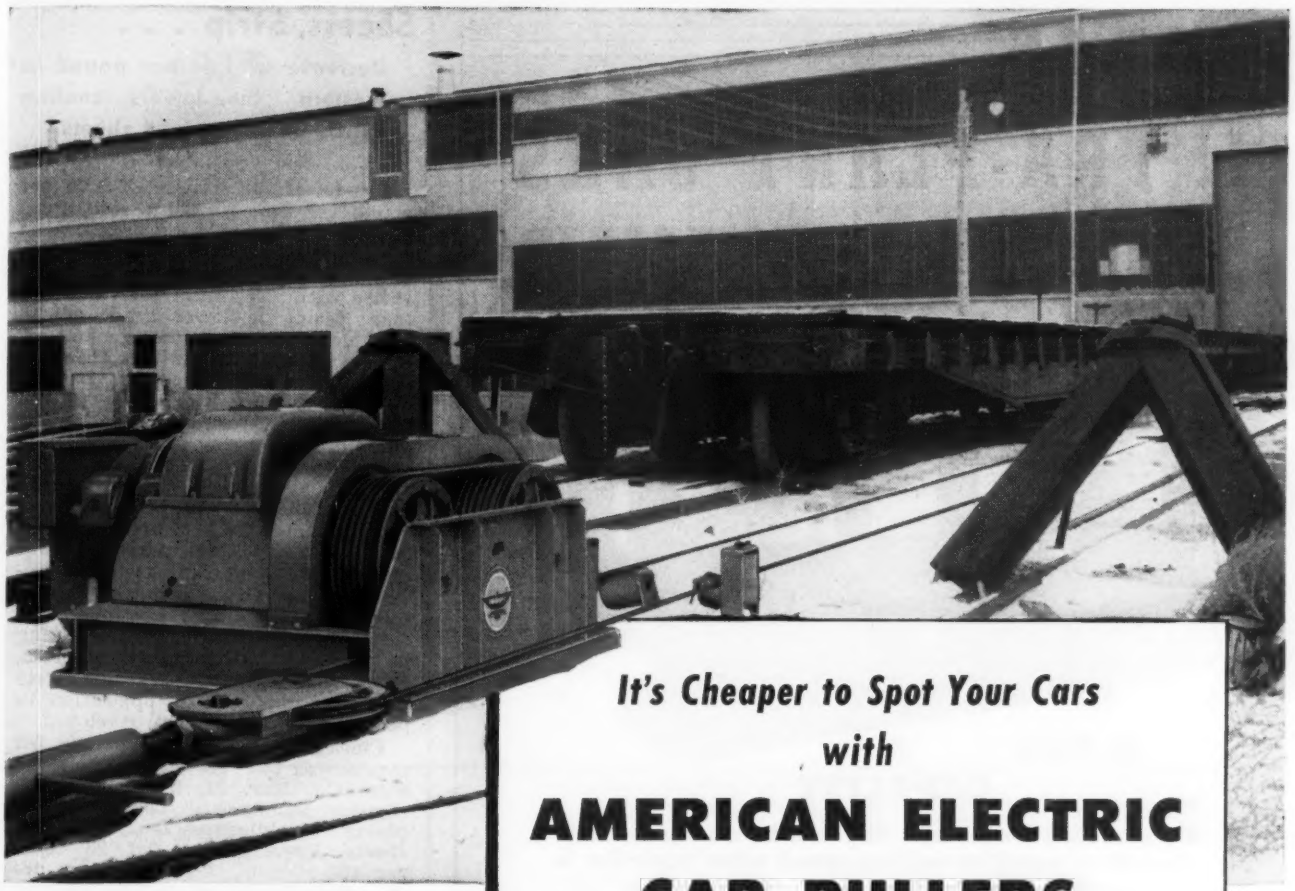
(Ceiling prices, delivered)

Heavy Melt.	$23.00
No. 1 Bundles	23.00
Mechanical Bundles	21.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	23.00
Rails, Rerolling	26.00
Bushelings	17.50
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	48.00
No. 2 Cast	44.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.



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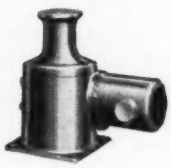
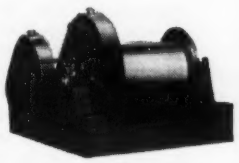
AMERICAN CAPSTAN TYPE CAR PULLER

Made in two sizes ... 5,000 and 10,000 lb. starting line pull. Self contained in rigidly constructed welded steel housing. Worm gear, on tapered roller bearings, operates in oil bath.



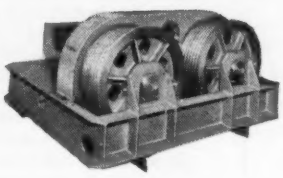
AMERICAN DRUM TYPE CAR PULLER

Made in six sizes ... from 4,000 lb. to 30,000 lb. starting line pull. Welded steel beds ... jaw clutches for disengaging drums ... outside contracting band brakes, foot operated.



AMERICAN CONTINUOUS ROPE CAR PULLER

Individually engineered to fit the job. Quotations and plans gladly furnished on receipt of information concerning the installation.



DO YOU KNOW what it costs you to spot a freight car? Count up the minutes lost while your men are waiting for the switch engine ... the delays that occur while each car is being spotted. At best, it's a slow, expensive process, requiring the work of several men.

With the AMERICAN Electric Car Puller, *one man* moves cars the instant you want them moved ... gets the job done quickly ... and spots cars to loading docks with absolute accuracy. Simple, rugged design in these Car Pullers assures dependable, trouble-proof operation. They are ready for work on a moment's notice, but never cost a penny for "stand-by" time. And in limited space, AMERICAN Electric Car Pullers eliminate completely the slow, dangerous job of moving cars manually with a pinch bar.

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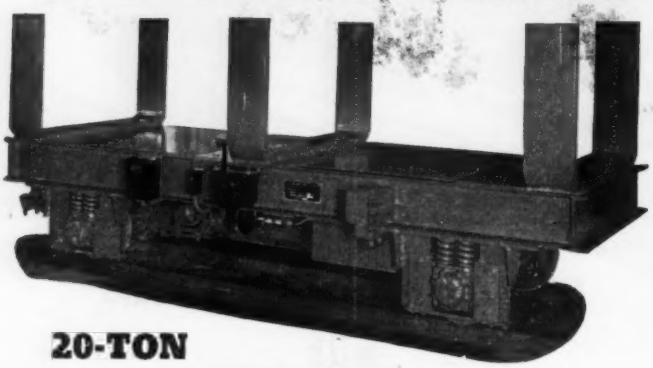

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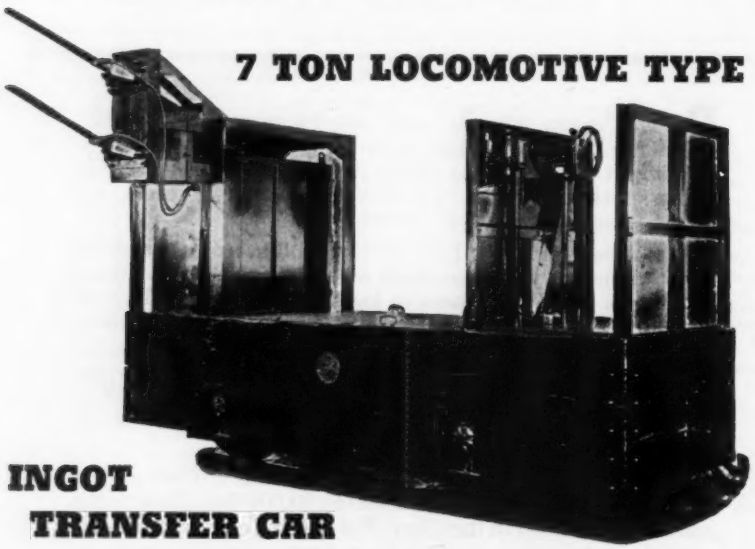
For handling long bars. Powered by storage battery. Geared to travel at walking speed when controller is held in operating position. Automatic return to "off" when released and magnetic brake is set.

7 TON LOCOMOTIVE TYPE



INGOT TRANSFER CAR

Operator station in elevated position at one end of car with magnetic switch control located at opposite end. Car is provided with hydraulic brake system with anti-friction roller bearings. Spring mounted journals.

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Sheets, Strip . . .

Decrease of 1.5c per pound in western zinc lowers coating extras on galvanized sheets

Sheet Prices, Page 130

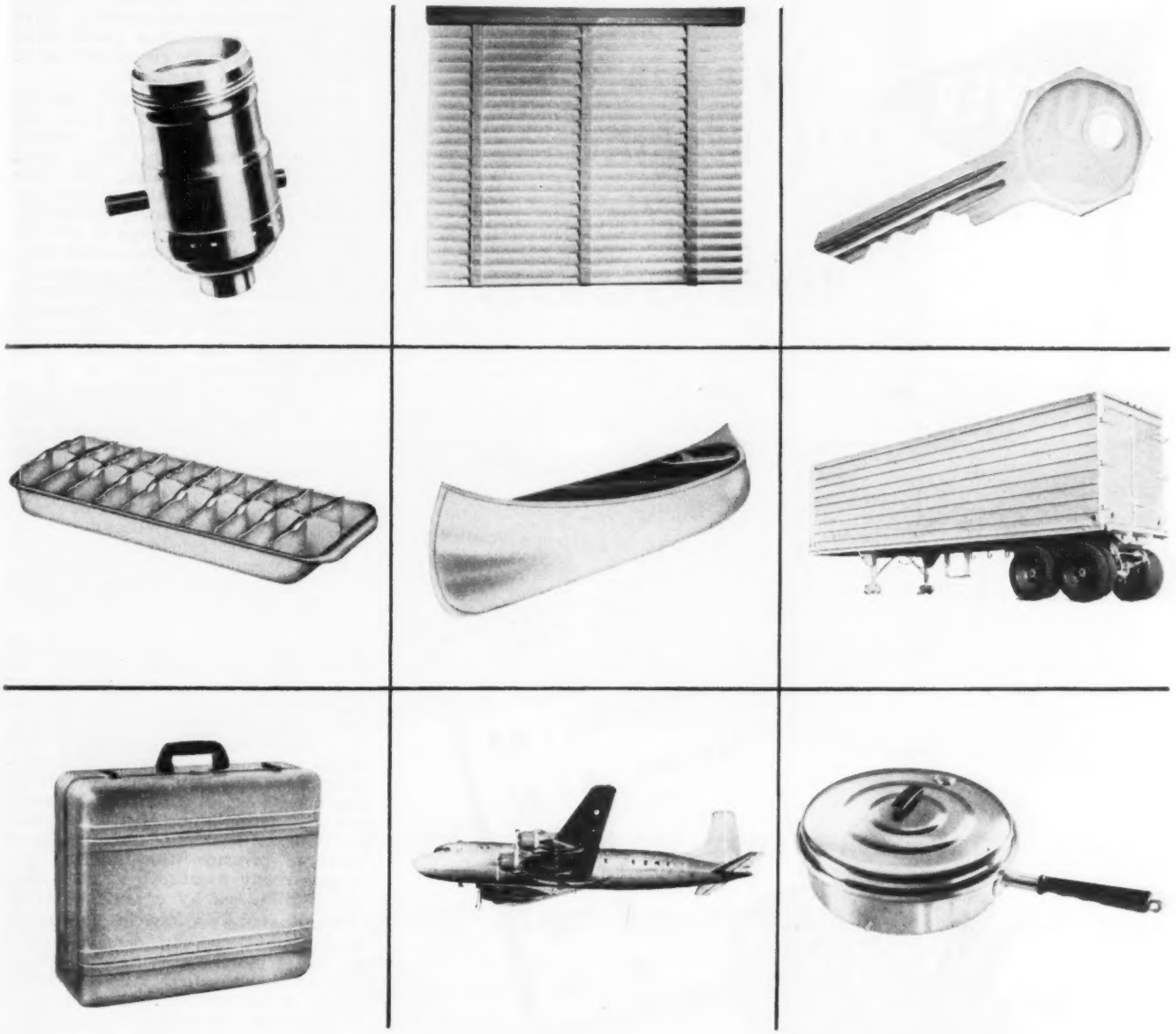
Pittsburgh — Decrease of 1.5c per pound in prime western zinc automatically lowers coating extras on galvanized sheets. Amount of reduction, on flat sheets for example, varies with gage from 80c to $5 per ton. Easing in lower grade silicon steel demand for motors, generators, etc., is expected to continue throughout most of second quarter. Late in the second period or early in the third quarter, resumption is anticipated of new buying at a scale below postwar peak levels.

Allegheny Ludlum was forced to curtail melting operations last week primarily because of a decline in silicon steel orders. Requirements for enameling stock have eased, but demand for galvanized and hot and cold-rolled sheets and strip continues well sustained with relatively little easing in pressure for deliveries reported. Some nonintegrated cold-rolled strip producers report little opposition to premium prices has yet developed.

Chicago—New extra schedule for sheets was put into effect by Inland Steel Co. Mar. 21, most important revision, tonnagewise, being that applying to pickling extras on hot-rolled sheets. Previously a flat 25 cents per 100 pounds, the extras now are 35 cents for 13 gage and heavier, 30-in. and wider, and 40 cents for those gages under 30-in. For 14 to 18 gage, inclusive, new schedule is 40 cents for 30-in. and wider and 45 cents for under 30-in. Pickling of 19 gage and lighter hot-rolled annealed sheets now carries a flat 45-cent extra, whereas previously extras varied on the individual light gages. Also included in the new card are increases, generally of 100 per cent, in extras for restricted thickness tolerances on hot rolled annealed sheets, cold-rolled sheets, enameling iron and Ti-namel sheets, re-squaring and stretcher leveling extras on the same products and including galvanized sheets, and new heat treatment extras applying on hot-rolled sheets. A quality extra which has not been published before is for special soundness. Amounting to 25 cents, it applies to hot-rolled and hot-rolled annealed and cold-rolled sheets.

Philadelphia—Sheets continue in easing supply. Pittsburgh and midwestern mills have not yet stepped up offerings of major grades here in any important degree, but have indicated they may be able to do better soon. Meanwhile they are vigorously pushing their specialties. Leading eastern producer has not as yet opened books beyond May, but appears able now to meet current demands of regular customers and still have some tonnage left over for others.

An outlet still exists for all hot and cold-rolled sheets and galvanized sheets offered at regular prices, even though there are a number of consumers who either are not interested in any tonnage at this time or are interested in only a limited amount. At the same time, some buyers, who have been out of the market for a



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How about *your* product? Does it fully utilize aluminum's advantages?

A change in alloy or temper may enable you to *improve your product* by giving it:

Increased strength . . . reduced weight . . . improved finish . . . greater durability.

Furthermore, by making a change in alloy or temper you may be able to *reduce your manufacturing costs* through:

Lower material cost . . . fewer fabricating steps . . . lower rejection rate . . . lower finishing costs.

Sometimes a minor change in product design—enabling use of a different alloy—will result in one or more of these benefits.

So ask yourself if you're taking fullest advantage of aluminum's remarkable versatility. If there's any doubt, call in a Permanente Metals' engineer and he'll give you the answer!

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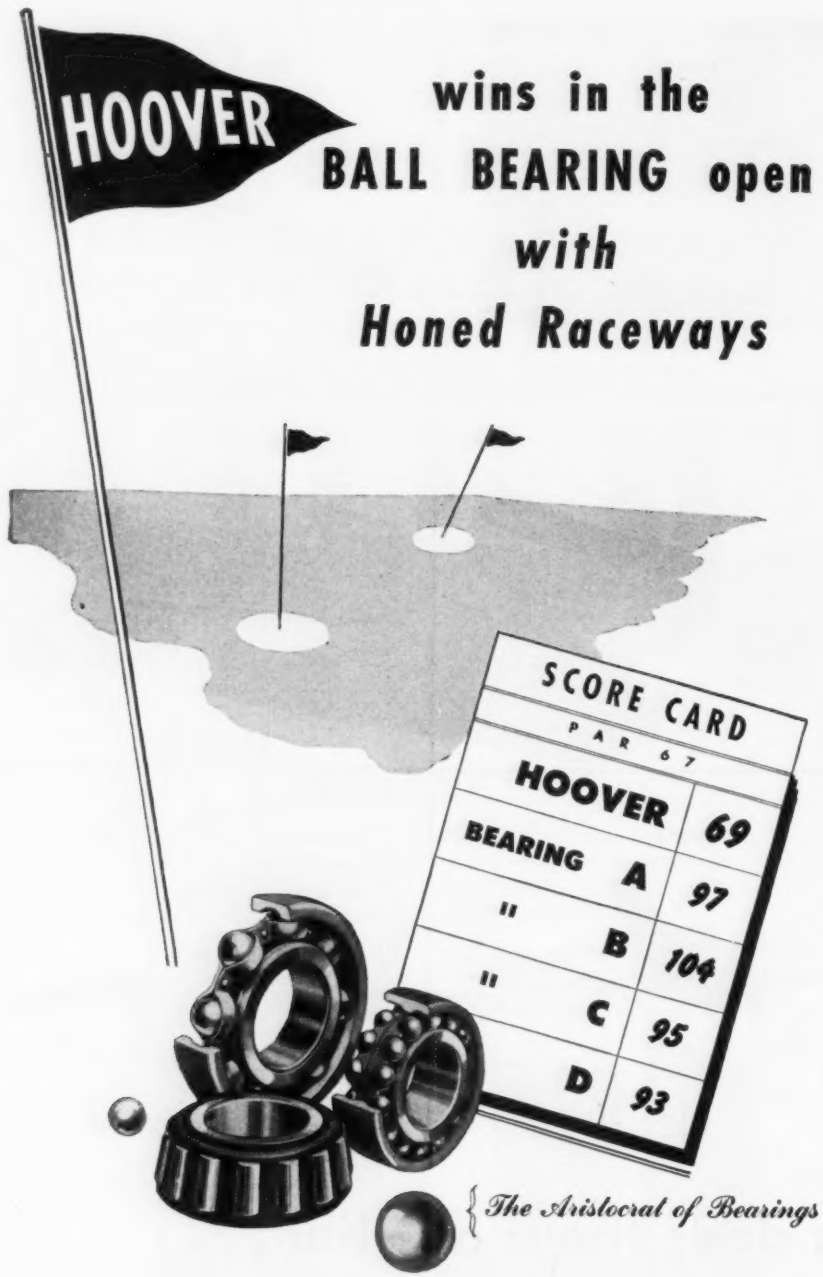

In golf, low score makes the champion. With bearings, low score in quietness is evidence of the championship anti-friction performance. These scores are obtained by measuring, in a scientific radio sound test, Anderons of sound of the ball bearing in operation. Recently Hoover ball bearings were sound tested in competition with four other nationally known makes. Three hundred and fifty ball bearings, of the same sizes and quality, were tested. Hoover Ball Bearings with Honed Raceways scored 24 Anderons lower than the nearest competitor! Would such championship performance, at a reasonable cost, add to the value of your product? A request, on your letterhead, will bring you a copy of the Hoover Engineering Manual.

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time, are again showing interest. These consumers apparently have gotten their inventories pared down and are willing to go ahead on at least a limited basis.

Boston — As consumers become cost-conscious, influence of f.o.b. mill pricing is more apparent. Impact was largely disregarded when want of steel was paramount, but with supply getting in balance with requirements, buyers paying the freight, importance of this change is now realized. More users of flat-rolled want steel at lowest delivered price, and, as competitive conditions develop, this has growing effect on buying and distribution; a few independent mills in the East never have gone over to f.o.b. mill selling.

New York — Pressure for sheets continues to ease, although demand is still greater than consumers can supply, particularly in view of existing backlogs. Various cutbacks are still noted, but the mills have no difficulty in diverting tonnage elsewhere. The overall outlook for the present is for continued easing in supply as second quarter gets under way, but with no balance between supply and demand for several months to come.

Cincinnati — District sheet mills have nearly completed schedules for May. They also report inquiries and bookings for the rest of the quarter assure demand in excess of output. The same mill interests have high hopes for continued capacity operations even though the market trend has been toward a balance in needs and production some time in the second half. Automotive manufacturers continue pressure for tonnage and appear ready to absorb wanted steel in cancellations by other industries.

Birmingham—A few cutbacks and cancellations, widely scattered and not large individually, have little effect on the tightness still evident in sheets in this district. It would take considerable more lessening of demand for the supply situation to even approximately catch up. But there are what steel interests describe as "straws in the wind" which may be more pronounced within a few weeks.

Los Angeles—Supplies continue to improve slowly and irregularly as small tonnages of surplus material find their way out of fabricators' stocks. Overall demand is strong, however, and pressure on mills for flat-rolled material has lightened only slightly.

San Francisco—Although supplies of sheets have not caught up with overall demand, the cautious buying by many consumers and spotty surpluses of material in hands of smaller fabricators indicate the market soon will come into balance. Galvanized sheets stand out as a relatively scarce item, but seekers of other flat-rolled products are experiencing little difficulty in shopping for their needs.

Plates . . .

Plate Prices, Page 131

Philadelphia—Plates are freer, although not in easy supply. Some producers are still behind on commitments and will go into next quarter with arrearages of at least a couple

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HY-TEN and AISI

of weeks. Most producers believe they will have little difficulty sustaining good operations over the next three months. Meanwhile, premium price mills in the district continue to adhere to existing schedules.

However, there is clearly a loosening up in sales policies. Whereas some mills a relatively short time ago were still limiting tonnage to regular customers, they are now broadening their field by also soliciting orders elsewhere for shipment before the end of the next quarter. Certain mills are even interested in tonnage for shipment beyond. Meanwhile, some producers have not yet been able to fill up their schedules for the entire second quarter, but are confident that they will be able to as time goes on.

Pittsburgh—Indicated reduction in plate tonnage under voluntary allocation programs is expected to make available a moderate tonnage of plates for miscellaneous applications. Demand for plates from freight car-builders and fabricators of barges, etc., has slackened in recent weeks. Some fabricators report order backlogs extend five to six months, in contrast to eight to twelve months through most of last year. Reflecting improved order backlogs among structural shape and plate fabricators, an increasing number are quoting on a firm price basis, although contracts with escalator clauses still dominate. A substantial increase in the number of bidders for both private and public work is another sign of the general reduction in order backlogs.

Boston—Although one non-premium producer is offering slightly more tonnage, easing in some directions is not reflected in more volume due to ability of mills to dispose of steel nearer home. Those who withdrew from this territory, in full or part, are still out, including one Pittsburgh district mill, formerly selling considerable tonnage. There is more premium volume available, but fabricators are shy except for badly needed fill-ins.

New York—While plate producers will go into the next quarter with some arrearages, they are gradually becoming current and the prospect for the next three months is for a freer supply of tonnage. Plate makers, however, anticipate little, if any, decline next quarter in their present high rate of operations. The softest individual spot in plate demand at present appears to be in the railroad field; next, is an easing in requirements of light tank fabricators.

Chicago—While overall demand for tubular products by the oil industry has apparently lessened, pressure for plates for line pipe is well sustained and of sufficient intensity to warrant continuation of several conversion arrangements. In fact, one district plate roller last week reported receiving a new contract on this basis for a substantial tonnage but indicated that this particular deal could be viewed as a "one-shot" proposition.

Tank fabricators note an increasing number of deferments on contemplated projects and view these deferments as practically identical with cancellations. Result is that completion dates for scheduled work can be advanced.

Birmingham—Little indentation has

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The ‹IGE› trademark stamped in the socket identifies top-quality electrodes immediately and signifies the most progressive methods known in the art of producing graphite electrodes. For at International, all phases of the manufacturing cycle are carefully controlled to assure the most desirable characteristics . . . electrodes and nipples are checked chemically and mechanically for top-quality and uniformity . . . threads are "miked" to eliminate misfits. There are no better graphite electrodes than International . . . none better for performance . . . none better for economy, that's why so many melters use them consistently.

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4779

been made in the plate supply situation by slowed down operations in a few scattered directions. Steel men say the demand has been so greatly in excess of supplies that the tonnage made available here and there is of little consequence in the overall picture. Heavy plates, it is reported, are particularly scarce.

San Francisco—Overall demand for plates remains heavy, although some slow-up is noted in inquiries for light plates. Heavy gages continue to be absorbed by large-diameter pipe fabricators. Steel jobbers say plates are most "critical" of all steel products, a condition not expected to change radically for a long period.

Seattle—Plates are in continued critical supply, handicapping shops in bidding for larger projects. Some sizable jobs are in sight, including additional tankage for Union Oil Co.'s Portland terminals. Demand for fabricated items is improving with opening of spring, particularly for small jobs of less than 100 tons. Operations are fair but plants could handle more work if materials were available.

Steel Bars . . .

Bar Prices, Page 130

Pittsburgh — Some alloy bar producers are forced to curtail melting and finishing operations due to continued lack of new orders as consumers adjust inventories to levels in line with a decline in their production schedules. Sellers are able to make urgent spot deliveries on most alloy products in early April.

Boston—While second quarter hot-rolled bar allocations are little changed from first quarter levels, consumers are generally assured more tonnage will be available if wanted. Exceptions may be flats and extreme small and larger sizes, four-inch and over. While some users failed to take in full quotas this quarter, allotments were distributed to other consumers. Unless current trends change, this may be more difficult next quarter. Supply troubles appear to be over for most consumers of cold-drawn bars and general run of alloys.

Birmingham—Bar demand is comfortably sustained as far as merchant items are concerned. Most insistent is demand for concrete reinforcing which mill interests say continues to come in from a variety of scattered sources to aggregate more than can be supplied on wanted schedules.

Philadelphia — Situation in hot carbon bars is mixed. Some producers are still tightly booked-up while others are definitely in an easier position. Also, some consumers still going like "a house afire" while others have relatively little to do. For instance, a spotty situation prevails among the small forgers, some being very busy and others not.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 130

Seattle—Rolling mill operations are steady at peak capacity, no recession for reinforcing bars being noted. Backlogs are heavy. A few cancellations for merchant bars are reported, due to weather conditions, but schedules were not interrupted as other material was rolled instead. Public works projects, largely Columbia Basin and Alaska, are absorbing large tonnages of reinforcing while small jobs of less than 100 tons each make a large total.

Structural Shapes . . .

Structural Shape Prices, Page 131

Pittsburgh—Structural fabricators report leveling off in downward trend of private inquiries the past few weeks, while public work has been well sustained in recent months. Order backlogs extend on an average of four months on structural fabrication work among local fabricators. Structural steel supply from the mills is reported somewhat easier, although leading producers contend output continues to fall short of demand.

Boston—With prices somewhat lower, but still high, district structural fabricating shops are more competitive; plain material supply is improving and contract awards hinge frequently on delivery, notably lots 200 tons and under. Heavier tonnage contracts, involving more detailed engineering and shop work, usually extend four to five months, even beyond, for shipment. New inquiry up for estimates lags for this season and few large tonnages are included.

Chicago—Floods in the Iowa-Ne-

B-L's 4½" thin wall. Insulation thicknesses are set by operating conditions.

suspended enclosures boost furnace efficiency

Bigelow-Liptak suspended enclosures include a four-ply seal — to keep heat in, air out.

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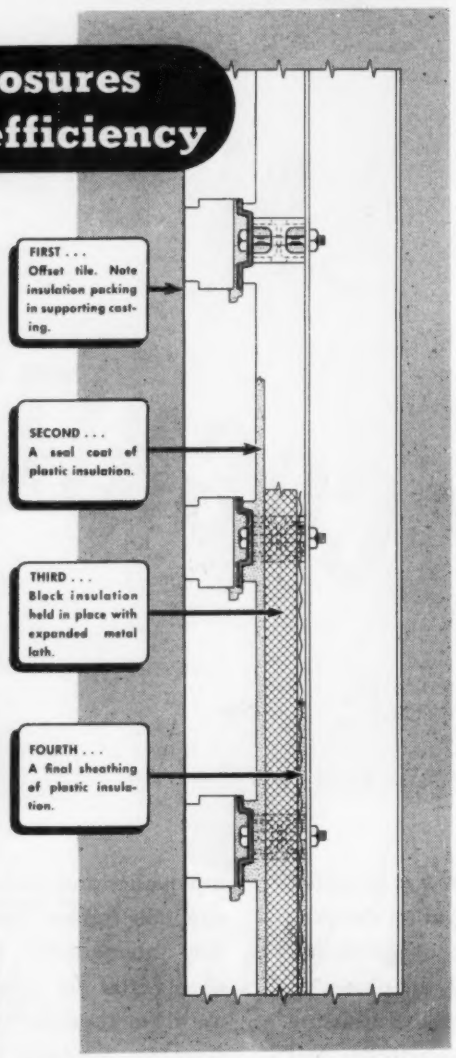
FIRST . . . Offset tile. Note insulation packing in supporting casting.
SECOND . . . A seal coat of plastic insulation.
THIRD . . . Block insulation held in place with expanded metal lath.
FOURTH . . . A final sheathing of plastic insulation.

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braska area probably will result in new bridge fabrication work locally, the damage done by water and snow estimated to have been considerable. Public works, including schools and churches, are most active here and fabricators' order backlogs are large but lacking in some degree firmness. As result of dubious nature of some orders increased interest is displayed in new inquiries, as many as 17 firms quoting on jobs which previously attracted only one or two. Degree of competition is further reflected in lower prices, the low bidder on one local job now pending reportedly quoting 15 per cent under estimate.

Birmingham — Even though comparatively few new orders are evident in structurals, inquiry is quite well sustained. There is in the offing a wide variety of construction projects for the early spring and summer with the result that little slack is expected in the shape picture for a few months, at least.

San Francisco—Signs of a seasonal construction upturn are awaited as clue to possible reviving of demand for structural materials. Most items now are fairly easily obtainable. Exceptions are products, such as wide flange beams, produced by eastern mills.

Seattle—Local fabricating plants have substantial backlogs, assuring normal operations for a considerable period. Some work has been declined because of material shortages. Wide flange beams are still in short supply. Placements of shapes approximated 5000 tons last week. About 1250 tons are immediately pending.

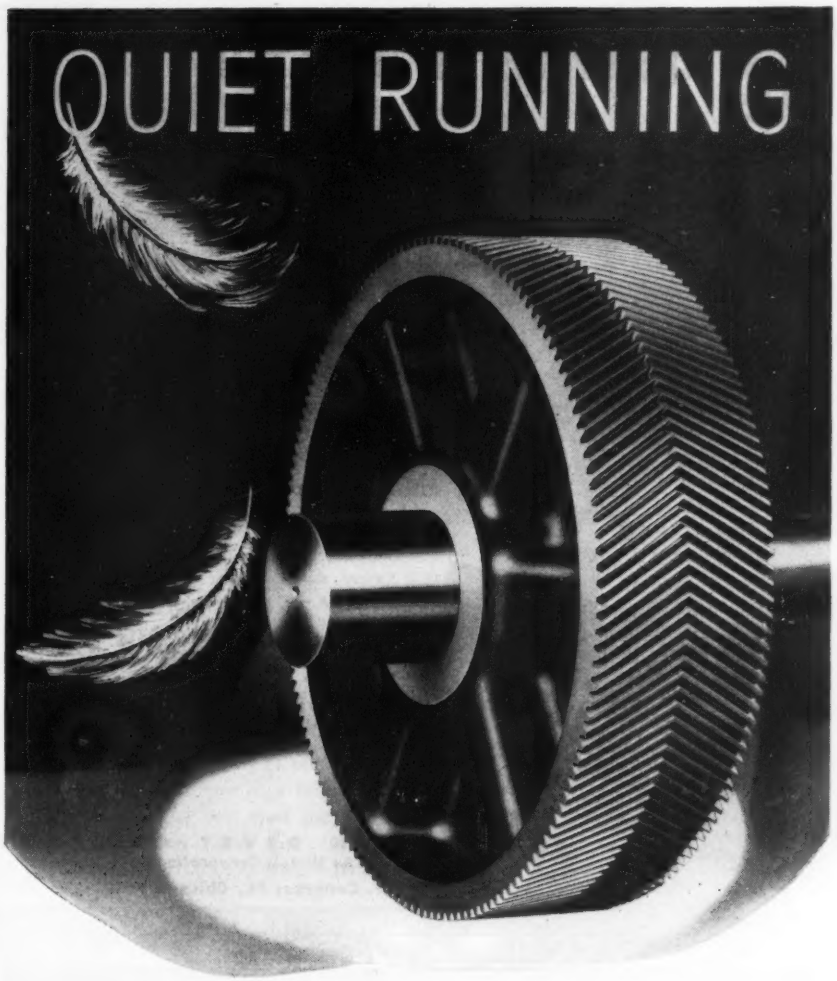
Philadelphia — Shape deliveries are easier. Fabricators and jobbers report somewhat better allotments from the mills for second quarter and believe that within the next two or three months supply and demand will be within reasonable balance.

Wire . . .

Wire Prices, Page 131

Chicago — A series of changes bringing prices into line with those of major district wire producers has been announced by Northwestern Steel & Wire Co., Sterling, Ill. Effective Mar. 12 galvanizing extra on nails was reduced from $3 to $2.80. Effective Mar. 17, base price of wire rods was reduced from $3.90 per 100 pounds to $3.40. Previously, on Feb. 21, manufacturers bright low carbon wire was reduced to $4.15 from $4.65. Welded wire reinforcement fabric has also been reduced, price now quoted being $5, against $5.35 previously. Merchant wire product prices have remained unchanged at competitive level. All company's products are based on Chicago. Northwestern's actions are similar to those recently taken by several other independent wire mills in the district.

New York—Wire users are inventory conscious and new orders have slipped to the point sellers are plugging for business; operations with consumers are spotty with steel wool production holding up well. Buyers are more particular as to specifications and there are scattered instances of rejections where material is not up to color; off-heat rod ton-



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nage is more difficult to move, although tonnage of semifinished available has not improved materially.

Boston—Generally speaking, larger consumers of wire have cut down buying more than smaller users; this reflects inventory to relative degree, although hardly any consumer group is excepted. Demand by the automotive industry has softened least and still holds at high level. War expanded capacity for some wire products is becoming more highlighted, notably music wire and wire rope; some price shading is noted in the latter, yet compared with prewar, current volume in rope is favorable. To meet motor truck competition, rail rate car lots, from Branford, Conn., to Fairhaven, Mass., is reduced to 36c per 100 pounds from 38c.

Birmingham—Wire shows the same tendency to balance supply and demand evident here over the past several weeks. Mills say they still are short on some sizes in nails, and that wire fencing will again become scarcer with advent of spring and the outdoor repair season, especially in the agricultural industry.

San Francisco—Reduced rate of home building has cut demand for nails, and weather has slowed demand from farmers for other types of wire products. Some seasonal upturn is expected within next month or so, but buying is unlikely to reach previous proportions.

Warehouse . . .

Warehouse Prices, Page 133

Cincinnati—Warehouse prices of Jones & Laughlin Steel Corp. were cut, greatest reduction being 20 cents. Base prices, country, with 10 cents added for city delivery, include: Hot-rolled bars, $5.35; cold-rolled bars, $6.10; heavy structurals, $5.35; hot-rolled sheets, $5.25; hot-rolled plates, $5.55; floor plates, $6.95. This company has also restored quantity differentials in accord with practice of other interests. Although official announcements are lacking, other jobbers were reported adjusting prices downward to meet competition.

New York—Slightly more tonnage in plates, structurals and plates, carbon products in short supply for many months, is coming in for warehouse distribution. Coupled with lower secondary demand, inventories move toward better balance, but with some distance to go with most distributors.

San Francisco—Plates and sheets are scarcest items on warehouse shelves, with most other products ranging from "ample" to "surplus" in meeting current demand trends. Consumer buying remains on a cautious, hand-to-mouth basis. Jobbers generally have balanced stocks of most materials.

Seattle—Turnover of warehouse items has increased slightly with improved weather but volume is below that of 1948. Uncertainty as to the season's fishing regulations in Alaska has deferred heavy purchases by the canning firms operating in the North. Sheets are reported increasingly critical with second quarter allocations the same as the first quarter, which were well below requirements.

Tubular Goods . . .

Tubular Goods Prices, Page 131

Discount rates on galvanized pipe have been raised 1½ point, reflecting the 1.50c a lb decrease in zinc prices. Increase in discount is equivalent to a decrease of $3 a ton on galvanized pipe.

St. Louis—Pressure on pipe is easing noticeably for first time since the war. It still remains the most sought-after steel product, but mills are not undergoing the former daily begging from consumers and warehouses. There are no cancellations or holdup orders as yet, but customers on the order books seem less anxious than before to take up their allotments.

San Francisco—Severe lag in cast iron pipe demand continues, and spotty needs for small-diameter steel pipe have increased supplies. Excess inventories of stainless steel tubing are reported. Some seasonal pick-up is expected soon, but no scarcities are expected to develop.

Semifinished Steel . . .

Semifinished Prices, Page 130

Pittsburgh — Phoenix-Apollo Steel Co.'s contract to supply the Apollo sheet mill with 12,000 tons of sheet bars monthly will expire Mar. 31 and will not be extended, it was reported last week. The steel mill is owned by Kaiser-Frazer Co. and the sheet mills by a syndicate representing a number of steel consumers.

Pig Iron . . .

Pig Iron Prices, Page 132

New York—Pig iron sellers here report an easing in specifications. This, they point out, does not necessarily mean a further reduction in the foundry melt, as there are indications that this is now being more or less sustained, at least for the present. However, it is regarded as meaning that foundries, which only several weeks ago were low on pig iron, have now got their inventories up to a point where they are becoming less interested in iron.

Pittsburgh—Merchant foundry iron output continues to fall short of supplying overall requirements, despite steady downward trend in operating schedules among jobbing foundries and others producing radiators, boilers, bath tubs, and railroad and mine car equipment. Some of these interests have shut down for an indefinite period, others are operating but 2 to 4 days per week.

Cincinnati — Pig iron is so much easier in this district that tonnage is being offered to foundries. The allocation plan has become obliterated in the lack of demand, in turn attributed to a low level of melt. Melters of iron for stoves are hard hit by seasonal and inventory influences.

Birmingham — Merchant pig iron melters have felt no measurable tapering off thus far in demand for their product. They have not been beseiged quite as consistently by some of the smaller foundry operators where a distinct slow down is still evident, but they are no better

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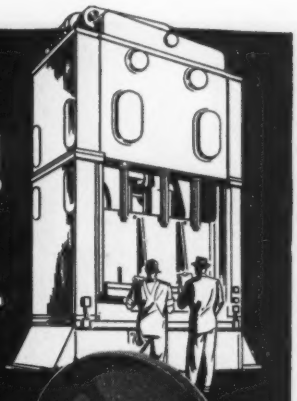

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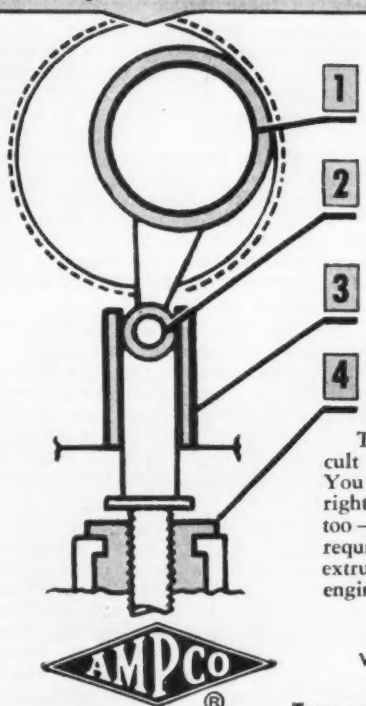

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off, from an overall viewpoint, even in the face of continued drop in scrap prices.

Philadelphia—Pig iron supply and demand are in fair balance, with some furnaces now actually building up a little stock. Domestic demand, however, is a shade better, although no marked improvement is anticipated in the immediate future. Meanwhile export demand is highlighted by two large requirements for basic, totaling 100,000 tons.

Lone Star Exporting Pig Iron

New York—Export license has been granted for shipment of 40,000 tons of basic pig iron to Great Britain. Iron is to be supplied by Lone Star Steel Co., Lone Star, Tex., with shipments to fall largely in April and May, possibly a little in June.

This is by far the largest sale of American pig iron abroad in a long time and shares the spotlight with an inquiry for 60,000 tons of basic for Japan on which bids are to be opened by the Army Procurement Office in Chicago, Apr. 11.

Scrap . . .

Scrap Prices, Page 136

Pittsburgh—Downward trend in scrap prices continued last week with sale of small tonnage of No. 1 heavy melting reported at $36, off $1 from previous quotation and $6 below the yearend level. Same interest purchased No. 1 bundles at $36, maintaining normal price relationship between these items.

Chicago—Brokers' offering prices were generally conceded to be lower again last week, with the whole list being affected. Only price which has remained firm this month is industrial scrap taken in directly from a few of the largest generators, but even this price, acording to reports as the month-end neared, is expected to be revised downward from the $35 top. Dealer No. 1 heavy melting scrap has sagged to a basis of $32-33 with No. 1 dealer bundles nominally quoted at $31-32.

Detroit—The market has lost all semblance of order, continuing to crumble pricewise in the face of total lack of buying. Published prices mean little as a consequence, but are being revised downward by $2 to $3 per ton. A few widely scattered "token" purchases to test the market are reported.

Cincinnati—Weakness persists in the iron and steel scrap market and prices are nominal in absence of new tonnage buying. Most old contracts have been fulfilled or have expired. Tonnage not shipped on time has been, for the most part, canceled. Weakness in the quotations stems chiefly from resistance of the melters to any augmenting of scrap inventories, the trend being toward a cut in stocks. Light demand for foundry grades continues.

St. Louis—Offering price of No. 1 heavy melting scrap dropped near the $29-$30 level of No. 2 last week as a consequence of a virtual cessation of interest in the higher grade. Practically all, if not all, old orders for No. 1 have been filled and there

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213	363	850	1450
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is no new buying.

Philadelphia—Scrap prices continue to decline with mills generally showing little interest. Two district mills which have taken off two and three open hearths, respectively, because of the falling off in conversion work, are now withholding shipments. A third eastern Pennsylvania mill, which has taken off two open hearths, is also said to be holding up on scrap shipments. No 1 heavy melting steel has been reduced $4 a ton to a spread of $31-$32 delivered.

Boston—With buying negligible, heavy melting scrap is off another $1 per ton. Minor grades have weakened even more and usual differentials are not operative. Cast prices are mixed and inclined to further weakness.

Dallas—Scrap prices weakened again in the Dallas market last week, with activity still further restricted. The widespread uncertainty as to the outlook has contributed additionally to the near stalemate in business, dealers report. Some concerns report orders for April delivery at around $3 under March levels, and there are no commitments beyond April. The steel mills and metal industries are reported as practically out of the market in this area.

Los Angeles—Despite the fall in prices and reduction in mill demand, marginal reclamation efforts continue in scrap metal. One firm has begun reclamation operations on a mountain of metal sweepings collected from yards of California Shipbuilding Corp. in Wilmington, near here. Undertone in scrap markets remains soft, but prices are unchanged.

San Francisco—Scrap movements remain restricted as industry speculates on new cut in prices which may come at any time. Mills generally are amply supplied and show no tendency to buy other than best quality material. Imports of Japanese scrap plus cessation of western scrap to eastern mills have given weak undertone to domestic offerings.

Seattle—Steel scrap is coming to the mills in satisfactory tonnages and inventories are rising. Outlook has greatly improved over 60 days ago. Bethlehem Pacific Coast Steel Corp., Seattle, received another 9000 ton-cargo of Japanese scrap.

Fontana Steel Price Cut Sharp

Los Angeles—Kaiser Co. has sharply reduced prices on various steel products produced at its Fontana, Calif., steelworks, bringing its quotations more closely in line with those quoted by other sellers on the West Coast. The reductions range from $10 per ton on carbon plates to $39 per ton on structural shapes.

No general announcement of the reductions was made to the press but customers were advised by letter, it is understood. The new schedule went into effect Mar. 22.

The changes bring Kaiser products more in line with those quoted by other makers although in most cases they still command a premium. Kaiser's prices have been far above those of other sellers for months past. In the case of shapes, however, Kaiser's Fontana price now is below that quoted by other sellers at Los

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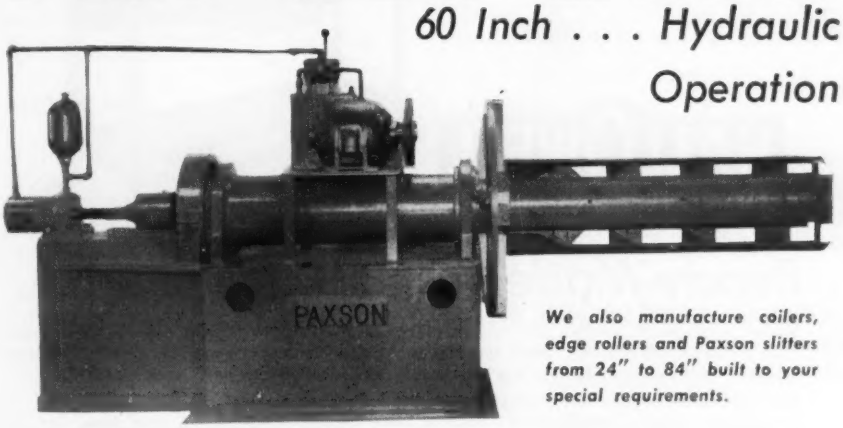

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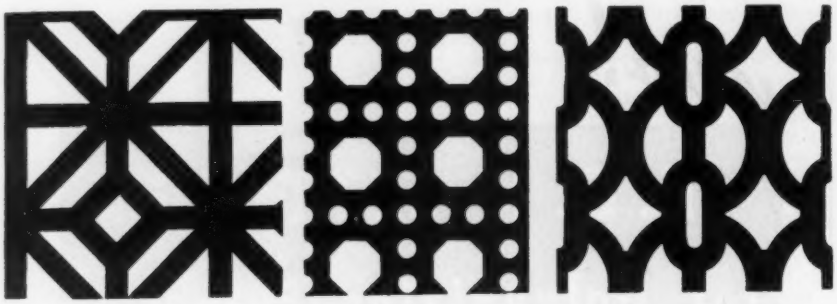

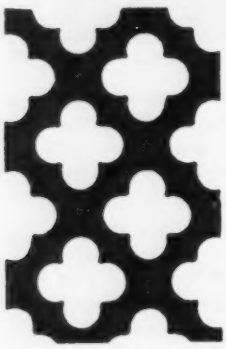

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Angeles, which has given rise to some speculation as to whether or not other sellers in the area would effect some adjustment.

Kaiser now quotes plates at 5.30c against its former price of 5.80c; standard structural shapes at 3.80c against 5.75c; carbon bars and small shapes, 4.00c against 5.30c; hot-rolled sheets, 4.15c against 5.65c; hot-rolled strip, 4.65c against 5.90c; cold-rolled strip, 5.55c against 7.10c.

Other West Coast sellers quote the following: Plates, 4.30c, Seattle and Minnequa, Colo.; shapes, 3.85c, Torrance, Calif.; bars, 4.10c, Los Angeles; hot-rolled sheets, 3.95c, Los Angeles; hot-rolled strip, 4.25c, Los Angeles; cold-rolled strip, 5.75c, Los Angeles.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

6900 tons, state bridge over Susquehanna river at Steelton, Pa., through Booth & Flynn, Pittsburgh, to Bethlehem Steel Co.

700 tons, building Phoenixville, Pa., to Phoenix Bridge Co., that city.

2000 tons, 500 refrigerator cars, to U. S. Steel Corp. and Bethlehem Pacific Coast Steel Corp., by Pacific Car & Foundry Co., Seattle, fabricator.

1400 tons, galvanized steel towers for Bonneville Power Adm., to Isaacson Iron Works, Seattle, low $398,626.

500 tons, 546-foot bridge over Nason Creek, Washington state, Great Northern Railway main line, to American Bridge Co., Gary, Ind.

400 tons, stop logs for Grand Coulee dam, to Pacific Car & Foundry Co., Seattle.

375 tons, boiler supports, Foster Wheeler Corp., Sunbury, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, addition, Brookhaven National Laboratory, Upton, N. Y., to Ingalls Iron Works, Birmingham.

200 tons, United Air Lines hangar, Seattle-Tacoma airfield, to Pacific Car & Foundry Co., Seattle.

175 tons, substations, Nostrand avenue, Sheepshead Bay, and Livonia avenue, Board of Transportation, New York city, to Grand Iron Works Inc., that city.

145 tons, 126-foot two-span I-beam bridge, Still river, Winchester, Conn., to Phoenix Bridge Co., Phoenixville, Pa.; Charter Oak Construction Co., Hartford, Conn., general contractor.

140 tons, Botanic Garden apartments, Cambridge, Mass., to Grossier & Shlager Iron Works, Somerville, Mass.; Aberthaw Construction Co., Boston, general contractor.

130 tons, building, Middlesex Supply Co., Lowell, Mass., to Grossier & Shlager Iron Works, Somerville, Mass.

125 tons, garage for Alaska Road Commission, Fairbanks, Alaska, to Standard Steel Fabricating Co, Inc., Seattle.

100 tons, gates for Alder dam, Tacoma Light Department, to Star Iron & Steel Co., Tacoma, low $19,200.

100 tons, manufacturing building, Huntington, N. Y., to Levine Bros. Iron Works Corp., Yonkers, N. Y.

STRUCTURAL STEEL PENDING

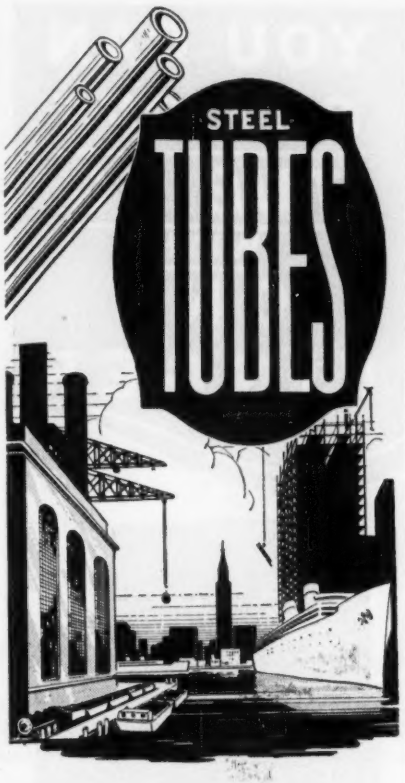
3000 tons, state hospital, Poughkeepsie, N. Y., Merritt-Chapman & Scott Corp., New York city, low on general contract; two other state hospitals at Binghamton and Buffalo also are active, with bids closing on the former project Apr. 6.

2000 tons, Pennsylvania Railroad freight terminal, Pittsburgh; bids Apr. 6.

750 tons, section, state Bronx express highway, New York city, Tully-Di Napoli & Gull Contracting Co., low on general contract.

280 tons, Pennsylvania Railroad bridge near Newark, O.; Bethlehem Steel Co. low bidder.

850 tons, Montana state highway bridges,



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Write for current TUBE STOCK BULLETIN

Yellowstone and Wheatland counties; bids to Helena, Mar. 21.

250 tons, turnpike bridge, Daulphin county, Pa.; bids Apr. 11.

200 tons, galvanized steel towers; Isaacson Iron Works, Seattle, low to Bonneville Power Adm.

165 tons, two welded state bridges, Little river, Bank street and Mill Pond, Seymour, Conn.; bids Apr. 4, state highway commissioner, Hartford, Conn.

100 tons, consolidated quarters building, Veterans Administration, Wilmington, Del.; bids rejected for the second time.

100 tons, laboratory, Socony Vacuum Oil Co., Paulsboro, N. J.; bids asked.

100 tons or more, slides, gates and fishway machinery, McNary dam; Northwest Marine Iron Works, low to U. S. engineer, $130,759.

100 tons, including reinforcing bars, towers and buss structures, Seattle Light department; bids Mar. 30.

REINFORCING BARS . . .

REINFORCING BARS PLACED

200 tons, miscellaneous construction projects, to Bethlehem Pacific Coast Steel Corp., Seattle.

200 tons, Seattle branch, Federal Reserve bank, to Northwest Steel Rolling Mills, Inc., Seattle; Kuney-Johnson Co., Seattle, general contract.

200 tons, state highway bridge, near Spokane, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; Clifton & Applegate, Spokane, general contract.

REINFORCING BARS PENDING

150 tons, three Montana state bridges; bids in to Helena, Mar. 21.

PLATES . . .

PLATES PLACED

1200 tons, for 500 refrigerator cars being built by Pacific Car & Foundry Co., Seattle, to Bethlehem Pacific Coast Steel Corp., and U. S. Steel Corp.

PLATES PENDING

Unstated, $900,000 marine terminal expansion of Willbridge plant, Portland, Oreg.; bids soon to Union Oil Co.

PIPE . . .

CAST IRON PIPE PLACED

Unstated, 2600 feet 6-inch water mains; bids Apr. 7 to U. S. engineer, Fort Peck, Mont.

Unstated, 3500 feet, 6-inch, class 250; bids Apr. 4 to Lois T. Newton, city clerk, Tukwila Wash.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Pennsylvania Railroad, four experimental electric freight locomotives, two of 5626 hp to Westinghouse Electric Corp., Pittsburgh, and two of 5000 hp to General Electric Co., Schenectady, N. Y. Each of the four locomotives will be comprised of two units.

LOCOMOTIVES PENDING

Ceylon Government Railway, ten locomotives to handle freight and passenger traffic, general specifications available through Department of Commerce or Ceylon Embassy, Washington.

RAILROAD CARS PLACED

Northern Pacific Railway, 250 refrigerator cars, to Pacific Car & Foundry Co., Seattle.

Western Fruit Express, 250 refrigerator cars, to Pacific Car & Foundry Co., Seattle.

RAILROAD CARS PENDING

Ceylon Government Railway, 99 sixty-foot single coaches, 28 four-coach articulator sets and 14 two-coach articulator sets, general specifications available through Commercial Intelligence Branch, Department of Commerce, Washington, or through the Ceylon Embassy, that city; a minimum of ten locomotives also sought.

Interstate, 50 fifty-ton hopper cars, bids asked.

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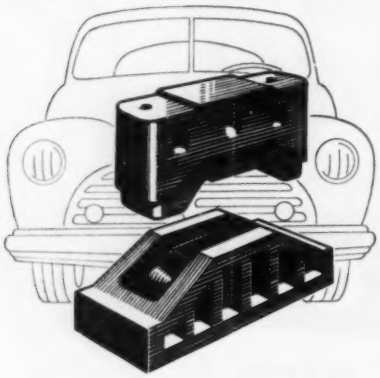

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S3 F13

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

BAKERSFIELD, CALIF.—Work has begun on construction of a $120,000 office and shop building to house buses of the newly renamed Bakersfield Transit Co.; Ernest L. McCoy, architect, W. A. Croft, contractor. The company was renamed from Bakersfield & Kern Electric Railway System.

CULVER CITY, CALIF.—Hughes Aircraft Co. has plans for a $500,000 plant; plans by H. L. Gogerty, 3123 W. Eighth St., Los Angeles.

EAST LOS ANGELES—Union Hardware & Metals Co., 411 E. First St., Los Angeles, will build a $3.4 million warehouse and office; A. C. Martin Association, 33 S. Beaudry St., architect.

LOS ANGELES—Consolidated Western Steel Corp. has awarded a $77,620 contract to Louis C. Dunn, 417 S. Hill St., for construction of an engineering building.

LOS ANGELES—Southern Counties Gas Co., 810 S. Flower St., has awarded a $279,269 contract to Stanton-Reed Co., 816 W. Fifth St., for construction of shop and office buildings; D. R. Warren, 500 S. Figueroa St., engineer.

SOUTH SAN FRANCISCO — Consolidated Western Steel Co., Butler Rd. and New Freeway, will build a $495,000 plant.

TORRANCE, CALIF.—Pittsburgh Plate Glass Co., 7412 Maie Ave., Los Angeles, will build a $1.7 million plant, warehouse and office; A. C. Martin & Associates, architect.

CONNECTICUT

BRIDGEPORT, CONN.—Singer Mfg. Co., 803 E. Washington Ave., has awarded an $800,000 contract to Austin Co., 19 Rector St., New York, for construction of a factory on Barnum Ave.

HAMDEN, CONN.—High Standard Mfg. Corp., 1817 Dixwell Ave., will build a $100,000 factory and office, Dixwell Ave.; Westcott & Mapes Inc., 109 Church St., New Haven, Conn., architect.

WEST HAVEN, CONN.—Armstrong Rubber Co., 475 Elm St., has awarded a $70,000 contract to Edwin Moss & Son Inc., 555 Grant St., Bridgeport, Conn., for construction of a factory, Elm St.; Fletcher Thompson Inc., 211 State St., Bridgeport, architect.

COLORADO

DENVER—Western Electric Co., 195 Broadway, New York, will build a $2 million warehouse, E. 40th Ave. between Columbine and Clayton Sts.; Roberts & Schaefer, 130 N. Wells St., Chicago, engineer and architect.

GEORGIA

ATLANTA—Western Electric Co., 820 Forrest Rd. N. E., will soon let a contract for a warehouse.

INDIANA

MARION, IND.—Victor Division, Radio Corp. of America, Front and Cooper Sts., Camden, N. J., has awarded a $500,000 contract to Sollitt Construction Co., 301 S. Columbia St., South Bend, Ind., for construction of a plant; Oscar R. Knab, R. R. 6, Box 23, South Bend, engineer.

MARYLAND

BALTIMORE—Inland Steel Products Co., 5300 Pulaski Highway, has awarded a contract to Morrow Bros. Inc., 2315 N. Charles St., for a $51,000 addition to its plant; Hall, Corder & Donaldson, 2111 N. Charles St., architect.

BALTIMORE—Truscon Steel Co., subsidiary, Republic Steel Corp., plans to complete the erection by July of a 1-story building to be used primarily for warehousing and office and sales departments.

BALTIMORE—Pan American Refining Corp.

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THE TUBE REMAINS STATIONARY IT'S THE CUTTERHEAD THAT ROTATES

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For low final speeds Worm Gear Speed Reducers should be selected on the basis of output torque ratings.

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received bids Mar. 25 for addition to research laboratory, Wagners Point.

MINNESOTA

MINNEAPOLIS—Northern States Power Co., 15 S. Fifth St., will build a $10 million generating plant, Lyndale Ave. South at Minnesota river; A. S. Keely, construction superintendent.

MONTANA

BILLINGS, MONT.—Carter Oil Co., 2081½ N. 29th St., has awarded a $146,900 contract to Continental Construction Co., Denver National Bank Bldg., Denver, for construction of a warehouse.

NEW JERSEY

CAMDEN, N. J.—Warren-Webster Co., 17 and Federal Sts., has received a bid from Leassie Builders Inc., 117 S. 17th St., Philadelphia, for $150,000 to construct a factory.

LINDEN, N. J.—Merck & Co., 126 E. Lincoln Ave., has awarded a $354,000 contract to Walter Kidde Constructors Inc., 140 Cedar St., New York, for construction of a plant.

WEST DEPTFORD TWP., N. J.—The Texas Co., 134 E. 42nd St., New York, will build a $150,000 oil separator building; D. W. Carswell, c/o owner, chief engineer.

SOUTH CAROLINA

CHARLESTON, S. C.—South Carolina Power Co., 141 Meeting St., has awarded a contract for construction of a $306,000 plant.

TENNESSEE

CHATTANOOGA, TENN. — U. S. Pipe & Foundry Co., Burlington, N. J., will expend $300,000 on improvements during 1949 and 1950; Paul L. Arnold, resident manager.

CHATTANOOGA, TENN.—Be-Ge Mfg. Co., Gilroy, Calif., will build a $100,000 manufacturing plant.

COPPERHILL, TENN.—Tennessee Copper Co. has awarded a $253,611 contract to Christian & Bell, 664 Spring N.W., Atlanta, for construction of a building; Hunt, Caton & Associates, James Bldg., Chattanooga, Tenn., architect.

OAK RIDGE, TENN.—U. S. Atomic Energy Commission, R. H. McCulloh, project engineer, has awarded a contract for $70 million to Maxon Construction Co., P. O. Box 327, for proposed uranium plant; Giffels & Vallet Inc., 1000 Marquette Bldg., Detroit, architect-engineer.

CANADA

HAMILTON, ONT.—Dominion Foundries & Steel Ltd., Depew St., will build a $15 million blast furnace; A. J. Boynton & Co., 54 E. Washington St., Chicago, engineer.

HAMILTON, ONT. — Canadian Westinghouse Co. Ltd., 286 Sanford Ave. N., has awarded a $1 million contract to Frid Construction Co. Ltd., 128 King St. E., for construction of a plant.

PETERBOROUGH, ONT.—Outboard Marine & Mfg. Co. of Canada Ltd. will build a $500,000 plant; contract awarded to Richard & B. A. Ryan, 1808 William St., Montreal, Que.

STURGEON FALLS, ONT.—Abitibi Power & Paper Co. Ltd., Sturgeon Falls, has awarded an $80,000 contract to Carter Construction Co. Ltd., 419 Cherry St., Toronto, Ont., for construction of a plant.

TORONTO, ONT.—Easy Washer Machine Co., 14 Miranda Ave., has awarded a $75,000 contract to Gatehouse Bros. Ltd., 86 E. Adelaide St., for construction of a factory.

TORONTO, ONT.—R. Reininger, 27 Bathurst St., will build a $70,000 machine shop, Dohme Ave.; owner builds.

PRICES OF LEADING FERROALLOY PRODUCTS

(Continued from Page 133)

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90c; ton lots 21.00c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Odd 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.). C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 8.90c per lb of alloy, ton lots packed 10.3c, 200 to 1999 lb 10.65c, smaller lots 11.15c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr.). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.00c per lb of briquet, c.l. packaged 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.0c, per lb of briquet, c.l. packed 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(**Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots, 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot $1.28, less ton $1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract, $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, freight allowed. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c, freight allowed.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Contract, 10,000 lb W. or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W., $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, f.o.b. Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60% Mn 5% max., Si 8% max, C 0.5% max.). Contract, ton lot, 2" x D, $2.90 per lb of contained Cb, less ton $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr. 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-12%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.25c, less ton 18.5. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 16.50-17.00c per lb of alloy; ton lots 17.90-18.00c; less ton lots 19.40-19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

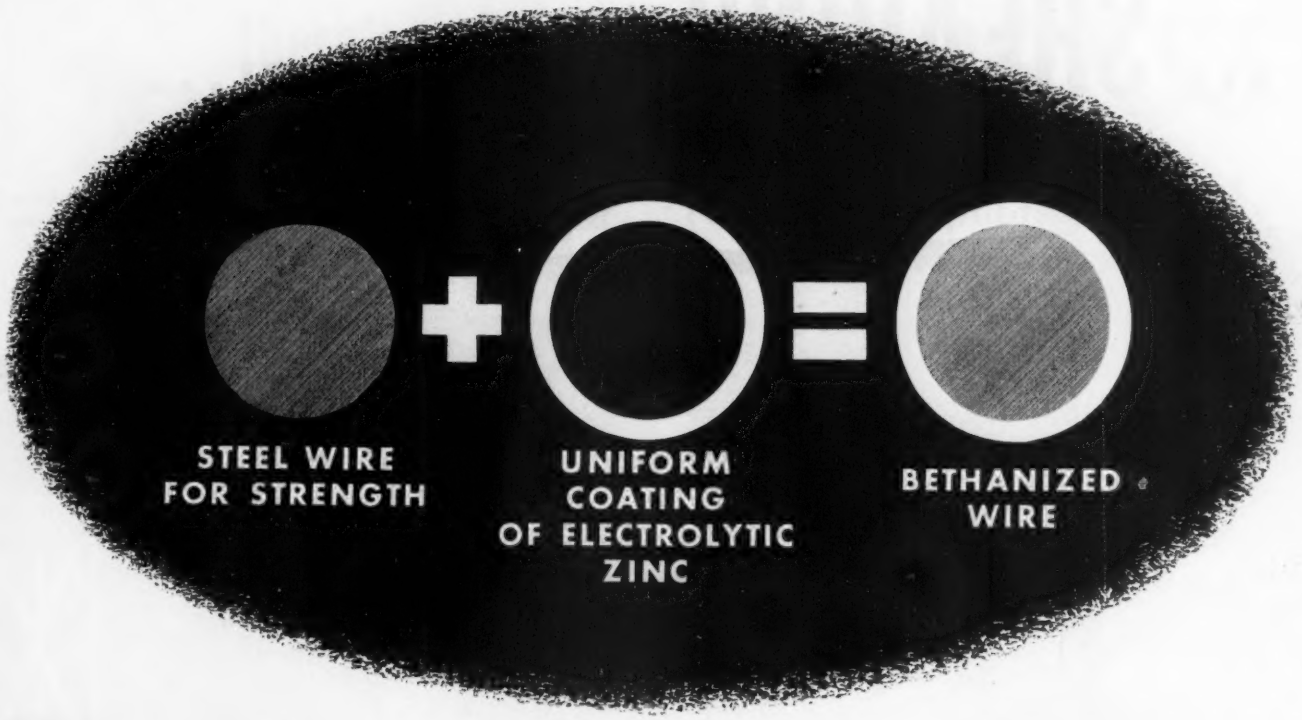
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.



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solves Forming and Corrosion Problems

The coating uniformity of bethanized wire is made possible by the electrolytic deposition of zinc, atom by atom—both around and along the wire. Here's the kind of protection you can really depend on for corrosion-resistance.

Ductility is another important feature. The zinc coating withstands the most severe forming operations because the 99.9-pct-pure zinc provides maximum ductility. Coating bond is a big advantage, too. The zinc armor is so tightly locked to the steel wire that you can twist it, bend it, wrap it, or even draw it through dies to fine gauge without cracking or peeling the zinc.

Bethanized wire has been used extensively for more than 15 years. Our backlog of orders is ample evidence of the satisfactory results it is giving in hundreds of different uses. Let us work with you in developing better wire products made of bethanized wire.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

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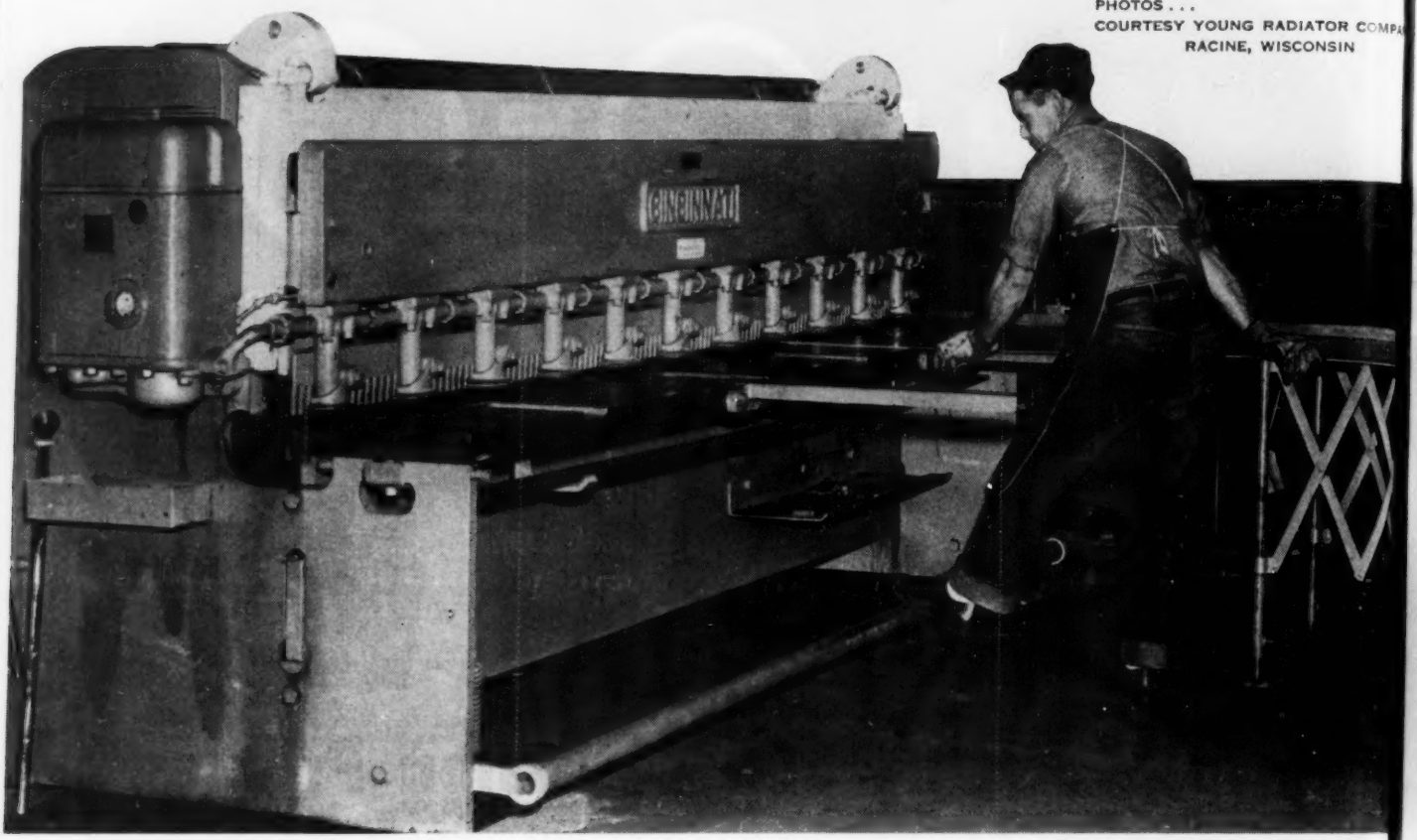
ALL SHEARING BY CINCINNATI . . .

PHOTOS . . .
COURTESY YOUNG RADIATOR COMPA
RACINE, WISCONSIN

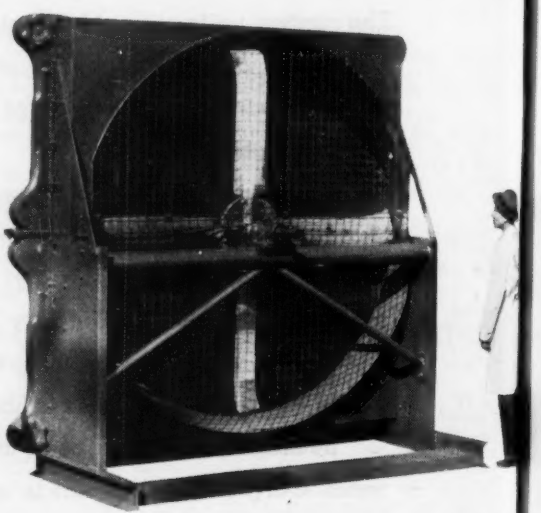


All the steel parts requiring shearing operations on these engine jacket water coolers are handled by Cincinnati Shears.

The rapid stroking and gauging of Cincinnati Shears save time, and the square corners and straight edges of blanks produced on Cincinnati Shears cut assembly costs and speed production.

For best results, consult our Engineering Department. We will gladly cooperate with you on your shearing needs.

Write for Catalog S-5 for a description of the complete line of powerful, speedy, all-steel Cincinnati Shears.



The Young-Happy Full Flow Engine Jacket Water Cooler with 93" variable pitch fan.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

There's a MULTIPRESS

REG. U.S. PAT. OFF.

to fit your specific needs!

A Multipress equipped with Indexing table special tooling and screwdriver hopper feeds for riveting electrical contacts on brass and spring steel contact arms.

Standard Accessories and Complete Tooling Delivers Your MULTIPRESS *Ready to Roll*

What Are Your Requirements?

Write Your Own Ticket!

MY JOB CALLS FOR . . .

- ☐ BROACHING
- ☐ STAKING
- ☐ CRIMPING
- ☐ FORMING
- ☐ TRIMMING
- ☐ BLANKING
- ☐ RIVETING
- ☐ COMPACTING
- ☐ MARKING
- ☐ ASSEMBLING

OF _____

TONNAGE

There's a Multipress made to fit your needs up to and including 35 tons.

_____

PRODUCTION REQUIRED

You name it! Amazing speed is what has won Multipress a place in hundreds of production plants.

_____

The Denison Eng. Co., 1163 Dublin Rd., Columbus 16, Ohio

Please tell me how Multipress can fit the above needs.

Name _____

Title _____

Firm _____

Address _____

City _____ Zone ____ State ____

Just size up your job requirements as suggested in the check-list at left. Then let Denison show you the Multipress that gives you highest efficiency at lowest cost. Frame sizes range from small bench units to floor models, with pressure capacities from one to 35 tons. Ram speeds up to 1300 inches per minute can give you fast production. You can have manual or automatic controls, for almost any type of ram action.

Hydraulic index tables, dial feed tables, knock-out cylinders and many other standard Denison accessories available as optional equipment. In addition, Denison's skilled tooling engineers can design and build special tooling you need, and test-prove the fully equipped Multipress using your actual production parts. You get a complete, packaged unit, *ready to roll.*

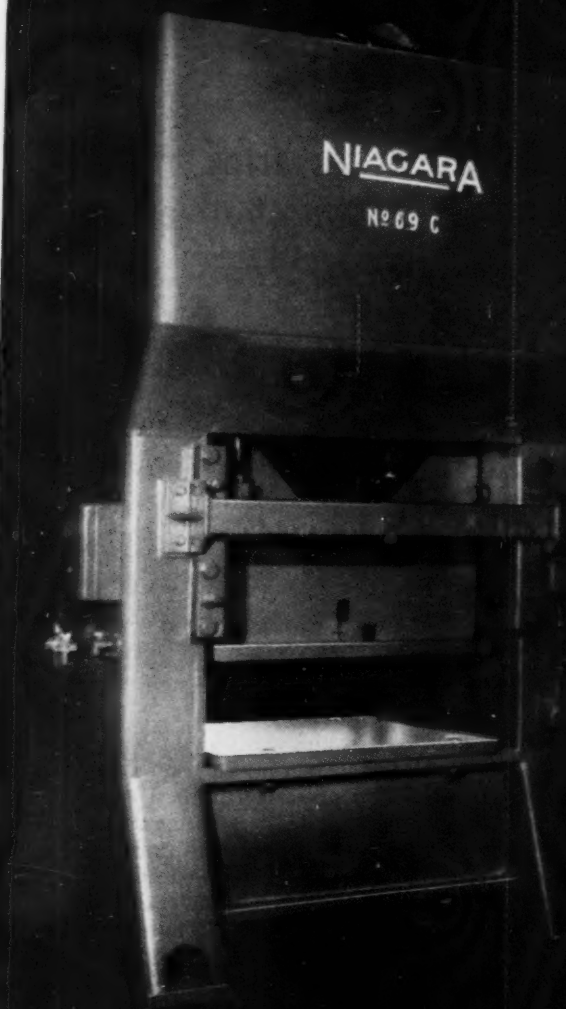
Jot down your job needs on this ad — and send it today for the full story on Multipress and what it can do for you.

The DENISON Engineering Co.
1163 Dublin Rd. Columbus 16, Ohio

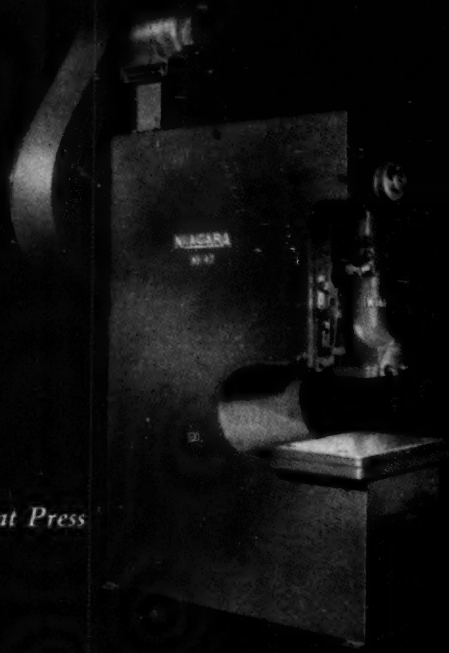
DENISON *Hydr*OILics

FOR ADVANCED DESIGN *look into....*

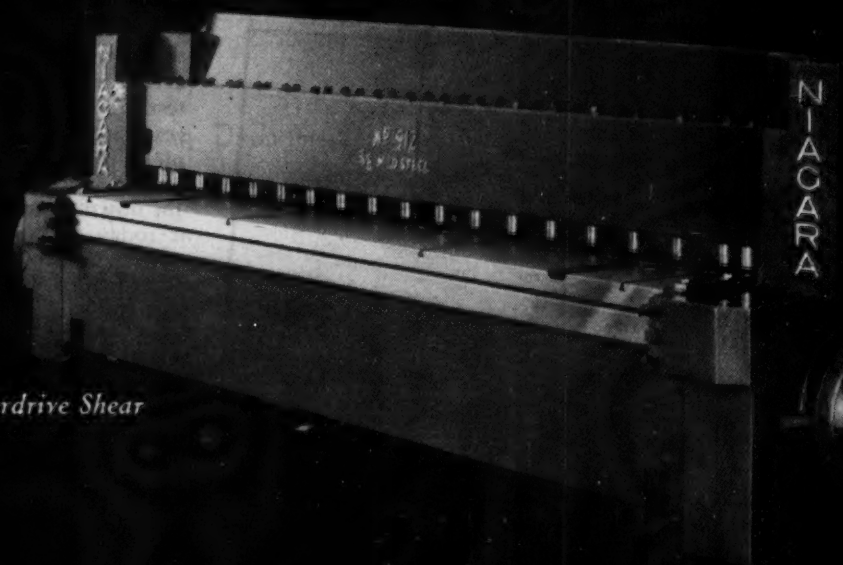
NIAG



Niagara Double Crank Press



Niagara Deep Throat Press



Niagara Underdrive Shear

NIAGARA MACHINE AND TOOL WORKS, BUFFALO 11, N. Y

AGARA

● The modern design of Niagara Presses, Shears and other machines for plate and sheet metal work is proof of the Niagara talent and experience that is built into them. Men responsible for economical production appreciate these results of Niagara engineering,—high hourly output...convenient operation...accurate work...reliable, uninterrupted performance with minimum down time...low maintenance cost.

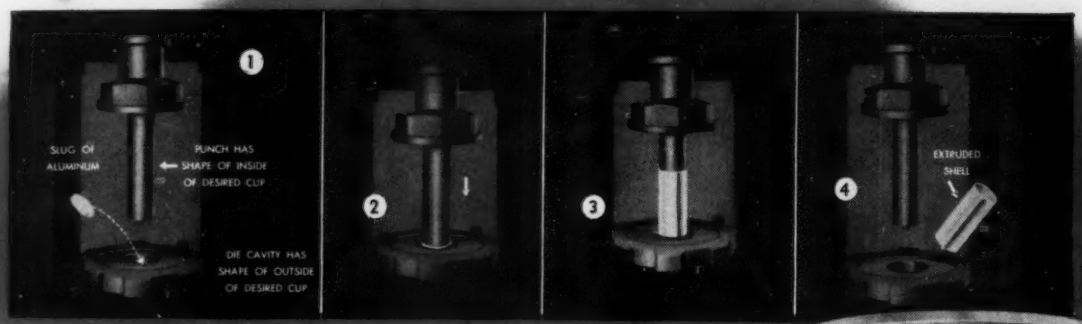
Write for Bulletins

Niagara Double Crank Gap Press

America's most complete line of

PRESSES, SHEARS, TINNERS TOOLS AND MACHINES FOR PLATE AND SHEET METAL WORK

N. Y. *District Offices:* **Detroit, Cleveland, New York**



FORMED IN A SPLIT SECOND!

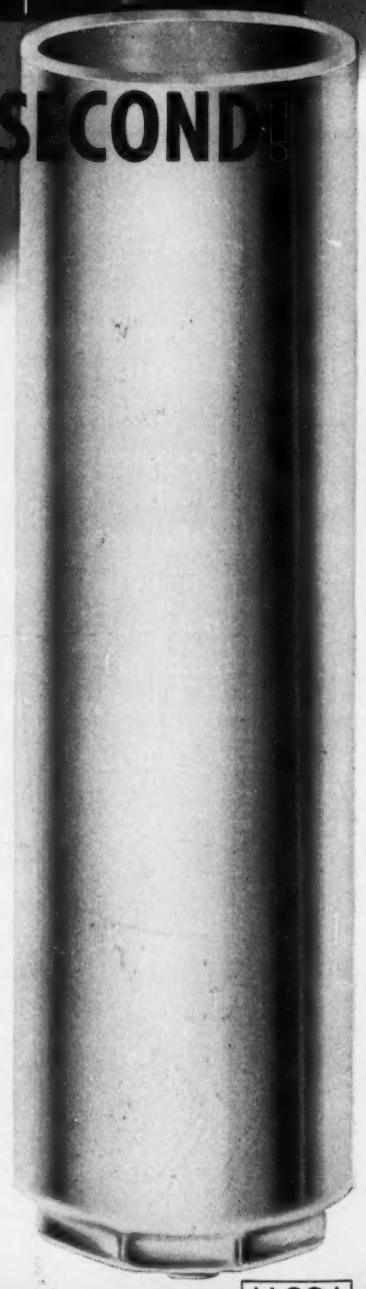
Grease Gun Cylinder Impact-Extruded by Alcoa with Integral Octagon Nut, Walls Heavy Enough for Thread Cutting

There's no laborious machining in the production of this grease gun cylinder, with heavy sides and bottom, octagonal nut, walls heavy enough for strong threads! One swift stroke of the Alcoa Impact Extrusion Press produces this shape in light, strong Alcoa Aluminum.

Thick or thin walls, cylindrical or square, heavy bottom or with integral boss, neck, lug or stem; there's almost no limit to the symmetrical shapes this Alcoa process makes possible at low cost.

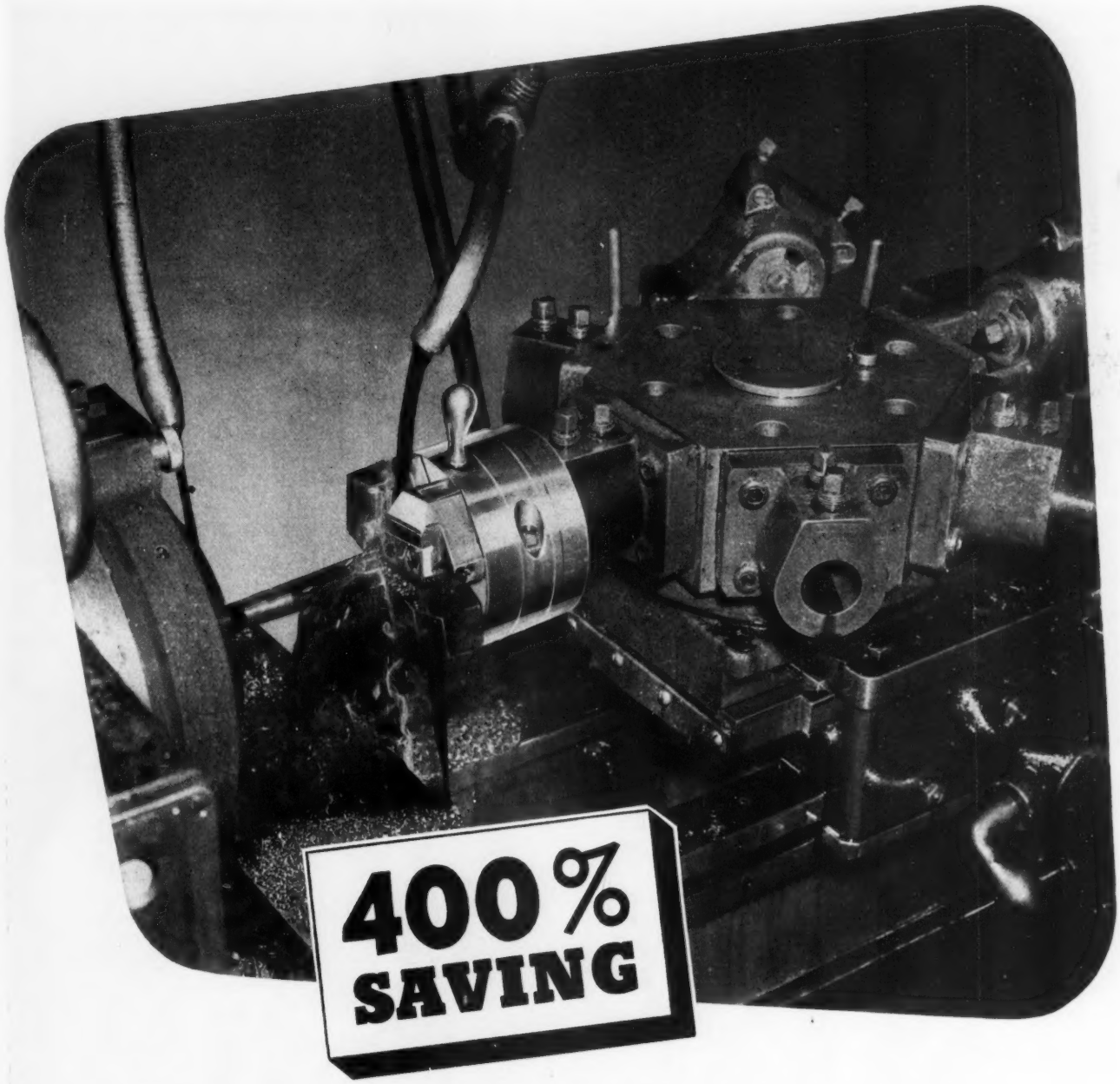
For housings, shells, chambers, bodies, or cylinders, up to 5″ diameter and 16″ long, you should have full facts on the Alcoa Impact Extrusion Process. Write today for your copy of the booklet shown, or call your nearest Alcoa sales office. ALUMINUM COMPANY OF AMERICA, 2170 Gulf Building, Pittsburgh 19, Penna.

Write for your free copy of "Alcoa Aluminum Impact Extrusions", 44-page booklet crammed with photos, diagrams and other information for designers.



ALCOA *Aluminum* **IMPACT EXTRUSIONS**

ALCOA ALUMINUM



TIME Study and Methods Department records of a large aviation equipment company furnish data of another job where LANDMATIC Heads have effected large savings in machine time and improvements in product quality.

In this operation, the 1¼" LANDMATIC Head on a turret lathe equipped with Lead Screw Attachment is cutting a 5/8-6 Acme thread on a Stabilizer Screw used by a light aircraft manufacturer. The thread was held to the close tolerance of ±.001 between the P.D. of the thread and the O.D. of the screw, for a full thread length of 5-3/8" on cold-drawn piston stock, Spec. #AISI, B1112.

The thread is now cut in one pass in .192 minutes with a spindle speed of 230 R.P.M., giving an average of 400 pieces per chaser grind. This is a saving of approximately 400%. Former methods required two passes—one roughing and one finishing cut—and hand fitting with the mating nut was necessary in assembly.

LANDMATIC Heads are stationary threading heads with self-opening action designed primarily for turret lathes. Their unusually-large oversize capacity makes them ideally suited for these machines. For detailed information and specifications, write for illustrated Bulletins F-80 and F-90.

LANDIS Machine COMPANY

WAYNESBORO • PENNSYLVANIA • U. S. A.

Sharp-eyed inspector
AT THE FLYING SHEARS
ADDITIONAL safeguards to quality: An X-ray eye on the flying shears eliminates over-gauge and under-gauge sheets. Then the eagle eye and practiced hand of this expert operator, with unerring skill, check the flatness of the sheet--insuring that electrolytic tin plate meets your essential requirements.
QUALITY
YOUNGSTOWN
SERVICE
Youngstown
ELECTROLYTIC TIN PLATE

THE YOUNGSTOWN SHEET AND TUBE COMPANY — General Offices — Youngstown 1, Ohio

Manufacturers of Carbon, Alloy and Yoloy Steel — Export Office - 500 Fifth Avenue, New York

ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS - SHEETS - PLATES - BARS - RAILROAD TRACK SPIKES

added production...without adding brick and mortar

When a comptroller talks about investment cost necessary to increase the production of machined parts, maybe he is figuring in the cost of increased floor space, too.

Of course, *you* know that Acme-Gridley Automatics often double the production of an ordinary machine without taking up any more space. But it might help to remind him that the new Acme-Gridley Automatics may make even *more* floor space available in your present plant—that it is not unusual for one new Acme-Gridley to replace two or even four older machines.

Perhaps you will want to have some facts and figures to back up your story. Below is a typical certified case study. Would more of these—on 4, 6 or 8 spindle Chucking Automatics—help you? They're yours for the asking.

CUT THIS OUT FOR USE WHEN YOUR COMPTROLLER WANTS PROOF

AN ACME-GRIDLEY CERTIFIED CASE STUDY

THIS IS WHAT HAPPENED:

MACHINE—Acme-Gridley 12" RPA 6 Spindle Chucker

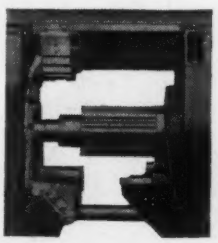
PART—6½" Diameter Heat-Treated Malleable Casting

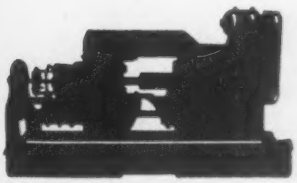
MACHINING TIME—For 18 operations, with tipped tools —one fifth of former method

Two Acme-Gridley 12" RPA 6 Spindle Chuckers now complete this part in one handling, doing the work of 20 obsolete machines they replaced—*and reducing cost per piece by more than 70%.*

AND HERE'S ONE IMPORTANT REASON:

A wide, open tooling zone is characteristic of the Acme-Gridley design. There's plenty of space for time-saving, moneysaving, independently-operated attachments that often save second operations. And more room means easier tooling, easier loading, faster chip disposal. All these are important reasons for faster floor-to-floor times on Acme-Gridley chuckers.

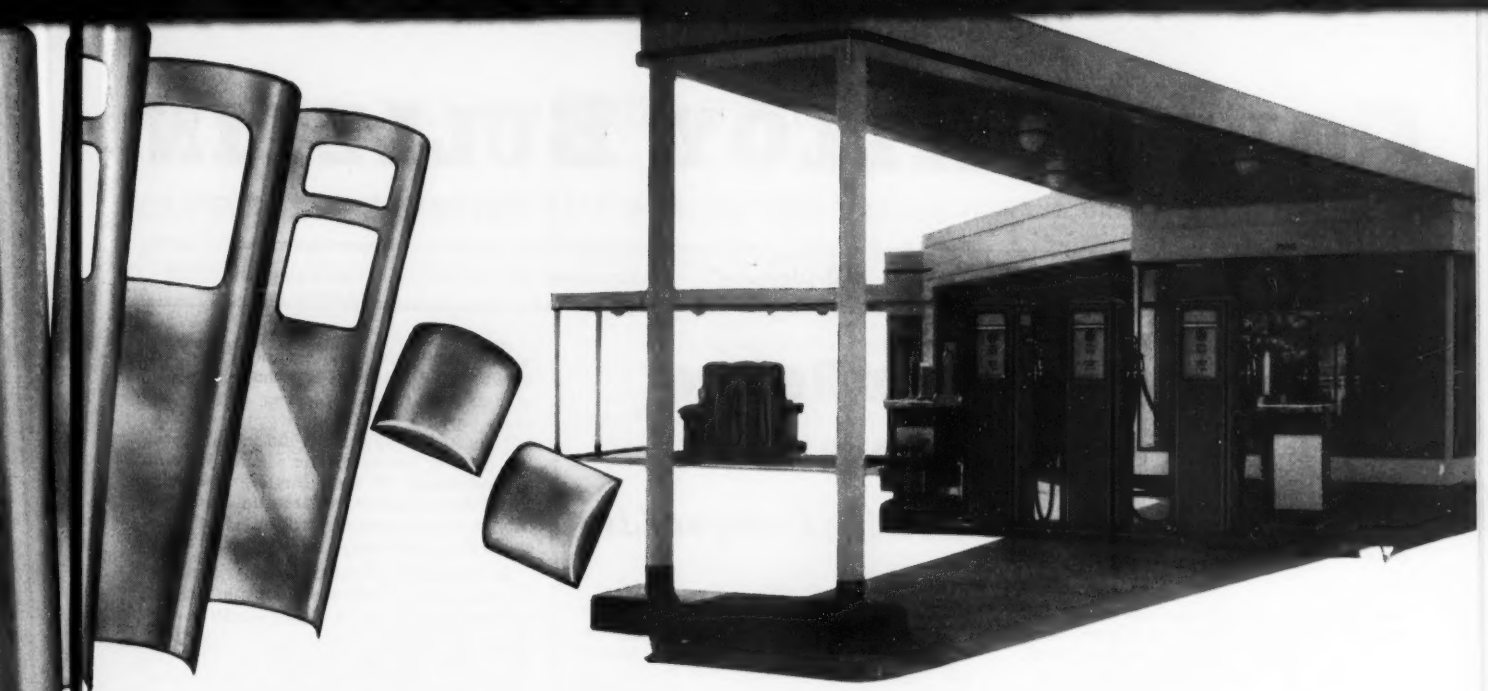




THE NATIONAL ACME COMPANY

170 EAST 131st STREET • CLEVELAND 8, OHIO

ACME-GRIDLEY BAR and CHUCKING AUTOMATICS built in 4, 6 and 8 spindle styles, maintain accuracy at the highest spindle speeds and fastest feeds modern cutting tools can withstand.



TOKHEIM gasoline pumps begin on a "BALDWIN"

Millions of motorists throughout the country get their gas from the sleek-looking, streamlined gasoline pumps produced by Tokheim Oil Tank and Pump Company. The plant in Fort Wayne, Indiana, keeps its production and quality up, *and its costs down*, with the help of a 400-ton Baldwin Hydraulic Press, which forms the various pump panels in one positive, precise operation.

Tokheim is only one of many manufacturing organizations that have learned from experience how the features of Baldwin presses pay out in greater output, fewer rejects, and all-round lower costs. The adjustable ram stroke and press pressure—the full-pressure capacity throughout the entire stroke—the positive overload protection—the automatic slow-down—the quick, simple die set-up—these are only a few of the many outstanding advantages that make Baldwin Hydraulic Presses economical production aids.

If you are thinking about installing a new press, or replacing an old one, send for Bulletin 285. It gives a concise story of the variety of presses produced by Baldwin, for forming and drawing . . . forging . . . extrusion . . . plate working . . . and dozens of other miscellaneous applications. No matter what your press need, you'll find it profitable to talk to Baldwin.

The Baldwin Locomotive Works, Philadelphia 42, Pa., U. S. A. Offices: Boston, Chicago, Cleveland, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Seattle, St. Louis, Washington. In Canada: Baldwin Locomotive Works of Canada, Ltd., Toronto, Ontario.

BLW THE BALDWIN GROUP **BALDWIN**

HYDRAULIC PRESSES

COPPER ALLOY BULLETIN

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared Each Month by Bridgeport Brass Co. "Bridgeport" *Headquarters for BRASS, BRONZE and COPPER*

Copper-Base Alloys Reduce Corrosion Loss

Give Products Dependability, Longer Life

The toll of corrosion runs into millions of dollars annually. The cost is not confined to the loss of the corroded product itself. It includes the loss of production, sometimes the loss of life, and the expense of maintenance and eventual replacement. It is particularly heavy in chemical and process industries, building construction, transportation and electrical transmission.

What can be done about it? It is only rarely that we can take the "teeth" out of the corrosive medium, which may be one of many combinations of water, oxygen, salts, gases or process liquids. "Isolating the patient" by application of a protective coating is sometimes practical, but too often not entirely satisfactory. Another way is to accept the fact that the material will corrode, and simply use more of it to lengthen its service life.

Obviously, immunity is worth any number of secondary cures. For this reason, materials inherently resistant to corrosion will pay their own way in increasing the reliability and service life of the parts in which they are used. Copper-base alloys have proved among the most resistant to corrosion for many applications. Metallurgical research, too, has consistently worked to improve the resistance of these alloys to corrosion, as well as to endow them with other desirable engineering properties, such as strength and resistance to fatigue and wear.

Products that may be improved corrosion-wise in service life by the use of copper-base alloys are innumerable, but may generally be classified as those exposed to weather, to water, and to process liquids or corrosive gases.

What To Do About The Weather

Rain, snow, sleet, dampness—are the most common offenders. Fasteners of all kinds—bolts, nuts, screws, nails, pole line hardware, wire and cable connectors—are exposed. Street, store and outdoor house lighting fixtures suffer attack. Roofing materials, flashings, gutters, siding metals must be made weather tight. Iron and steel exposed to such service rust away rapidly.

On the other hand, we are all familiar with the green patina formed on copper and copper-base alloys on long exposure to the weather. Patina develops very slowly, is highly protective to the underlying metal, and in the course of years, becomes increasingly protective.

Products exposed to weather can be improved by the use of such engineering alloys as the Silicon Bronzes and Aluminum Bronzes, where engineering requirements call for high physical properties, and by using copper, or brass containing more than 85% copper, for less severe applications. Long experience has shown copper and high copper alloys, such as Bridgeport 609 Silicon Bronze and Cupro Nickel to be both highly corrosion-resistant and practically immune to season cracking. This explains why they are widely used for engineering applications.

Many materials season crack under certain conditions. With yellow brass, however, season cracking may take place when the material is under stress and exposed for a period of time to the combined attack of oxygen, moisture, and ammonia. Ammonia is a common gas often present in small quantities in the atmosphere. It results from the decomposition of nitrogen compounds in animal or vegetable matter and from the combustion of coal and other sources. Weak ammonia solutions may be found on the surfaces of material where moisture has condensed out of the atmosphere.

Is Water Washing Away Profits?

Corrosion from water is a slow drain on the profits of every industry. Piping, plumbing, heat exchangers, evaporators, condensers, coolers, valves, tanks, filters, screens, fasteners, radiators and other products are all vulnerable. Fortunately the use of corrosion-resisting copper tubing and brass pipe for plumbing, heating, oil lines, refrigeration and general industrial piping has greatly increased the service life and dependability of such installations. The use of brass, silicon bronze and aluminum bronze has prolonged the life of machinery and equipment.

Rust takes a heavy toll on industrial and process equipment and in building construction.

Because water conditions vary from time to time, as well as from one part of the country to another, a wide variety of condenser tube alloys has been developed for fresh water and sea water service. These include Admiralty, Cuzinal (aluminum brass), Duronze* IV (arsenical aluminum bronze), Cupro Nickel, and Duplex Tubing. The latter consists of two tubes drawn together, each made of a different metal or alloy. Selection of the proper condenser tube alloy is a matter of the combined experience of the equipment operator and the brass mill's laboratory staff, which should be consulted.

For stopping corrosion in valve stems, gates, seats and bonnets, Duronze** III silicon aluminum bronze has proved highly successful. This alloy is not subject to dezincification; it has a low coefficient of friction against steel, and so reduces wear from moving parts. It has exceptional tensile strength, as high as 90,000 psi in the annealed condition.

Processing Corrosive Products

Continuous production is the basis of operating economy in many industries—oil refining, food processing, paper and pulp, sugar and salt refining, chemical processing and ammonia refrigeration. Often extremely corrosive conditions are inherent in the process. Breakdown at any stage can bring serious interruptions of production, as well as contamination of product. Economy dictates the selection of those alloys that will serve most dependably. Consequently, there's hardly an industry that does not make extensive use of copper and copper-base alloys.

In many cases, the corrosion problems of industrial processes require individual study and experiment before the most suitable alloy can be recommended for the conditions encountered.

Laboratory Assistance

Manufacturers unable to keep up with the many important metallurgical developments in copper-base alloys may be operating with metals that are outmoded by newer, improved alloys. It is suggested that fabricators carefully review all of their metal specifications to make sure that their products are made from the most suitable materials. To aid you with alloy selection and application, our Laboratory gladly offers its services. Contact our nearest branch office for help with your corrosion problems, assistance that will extend the life of your equipment and increase its reliability and safety. Write for Bridgeport's 80-page Duronze Manual if you do not have a copy.

*U. S. Pat. No. 2,093,380.
**Reg. U. S. Pat. Off.

CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, Research Chemist of the Bridgeport Brass Company.

Galvanic Corrosion in Salt Water Cathodic Protection by Magnesium

In recent years, considerable interest on the part of users and producers has developed in connection with the use of magnesium or aluminum for the galvanic protection of metal equipment (tanks, heat exchanger water boxes, etc.) handling sea water. In many instances, the results obtained have been very encouraging since (a) a substantial current continues to flow between magnesium and all metals less active than magnesium (see Copper Alloy Bulletin, November, 1948) even after months of exposure and (b) the magnesium anodes remain active without the necessity of cleaning. In common with all effective methods of cathodic protection the quantity of current flowing and the potential difference between the magnesium and the metal being protected is high enough to lead to the deposition of a protective layer of minerals from the sea water. Cathodic protection against corrosion in fresh water is discussed in the September, 1948, Copper Alloy Bulletin.

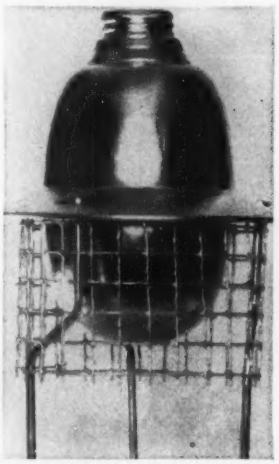
It must be remembered that cathodic protection by zinc, aluminum, or magnesium anodes is possible *only* when a simple circuit with good electrical contacts and continuous current flow are maintained at all times between the dissolving anode and the surfaces being protected. Many water storage tanks or heat exchanger water boxes made from ferrous metals are being protected successfully by this method. On the other hand, due to the complicated electrical path presented by a shell and tube type condenser or heat exchanger, it is difficult to protect ferrous tubes. Here the best means of keeping corrosion to a minimum continues to consist of (1) using the best copper-base tubing alloys available for the conditions, (2) keeping the tubes clean and (3) water treatment where required.

It is expected that this method of galvanic protection through the use of active anodes will continue to increase. This should be especially useful where a simple compact, self-contained system is desired and the electrical resistance of the solution is not too high.

For references and information on Cathodic Protection see:
H. H. Uhlig, "Corrosion Handbook," pp. 923-950, John Wiley & Sons, Inc., 1948.

"No-Freeze" Roof Strainers Made From Brass Strip And Rod

"No-Freeze" Roof Strainers made by A. & J. Screw Machine Products, Newark, N. J., are designed to keep leaders clear during the winter by melting ice and snow. The unit consists of a container with a perforated bottom, legs and drain screen. The container is filled with a crystalline chemical and inserted in the top of the leader.



"No-Freeze" Roof Strainer made from brass strip and rod. Courtesy A. & J. Screw Machine Products, Newark, N. J.

Brass, because of its good ductility, is suitable for blanking, drawing, spinning and stamping operations. The body is made from strip—the legs from rod.

This unit is typical of the many products that are easily fabricated of brass.

Among its many mill products, Bridgeport manufactures brass, bronze, copper sheet and strip for drawing and stamping; many excellent screw machine alloys in rod and tube form; rod and wire for cold heading.

Silicon Bronze and Aluminum Bronze alloys possessing remarkably high strength, exceptional corrosion resistance and great permanence are widely used for engineering applications. Other mill products include condenser and heat exchanger tubes and Duplex tubing, as well as bronze welding rods for fabrication and repairs.

Modern mills in Bridgeport, Conn., and Indianapolis, Ind., are staffed with experienced laboratory and production men, who are ready to help with your metal problems. Send for our Technical Handbook.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

New Collett Chuck Linkage opens and closes chuck on axial movement of machine spindle. Chuck can be fitted with spring ejector or designed to allow workpiece to fall through at end of cycle. **No. 919**

Roll Type Gage sorts beads, discs, small rolls, pins, plugs, or bushings into size groups based on their smallest dimension. **No. 920**

Pneumatic Screw Driving Machine automatically feeds #4 to #10 screws from hooper to head and drives them. Feed tube length may be as great as 50 feet. Takes slotted or recessed-head wood, self-tapping or machine screws. **No. 921**

Forging Blank Preformer is said to distribute stock to meet requirements of final forging in uniform blanks free of shuts and folds. Machine can be used as adjunct to hammers or forging presses. **No. 922**

Electronic Alignment Gage is reported to assure accurate setting of grinding machine table for producing straight shaft or exact taper. Displacements of 0.0001" are said to be detected easily. **No. 923**

New Thread-Generating Machine is said to be particularly suited for threading lead screws, feed screws and worms. Lathe type machine generates thread on rotating bar stock. In plain and universal designs in four bed lengths between 18" and 116". **No. 924**

Lubricating Oil Testing Kit can be used to check oil condition from four aspects in a period of about 25 minutes. Factors checked are asphalt and other gummy materials, dirt, scuff metal, sediment and water, fuel dilution, and acidity. **No. 925**

Turret Table Hydraulic Press mounts a number of assembled die sets for a number of runs of different sorts of work. Any set can be positioned under ram without disturbing other sets. Rate of 157 strokes per minute attained by smallest of three types rated 10, 20 and 30 tons. **No. 926**

Corrosive Liquid Filter suitable for handling plating liquids is said to rate 1,860 gallons per hour on open pumping. Temperature range is 0 to 180 deg. F. **No. 927**

Ground Mills having 3-32" diameter shanks are offered in ten shapes, said to be ground from the solid after hardening. Said to outlast ordinary burrs many times, and reground at a nominal cost, will outlast several carbon steel burrs. **No. 928**

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL

"Bridgeport" BRASS

BRIDGEPORT BRASS

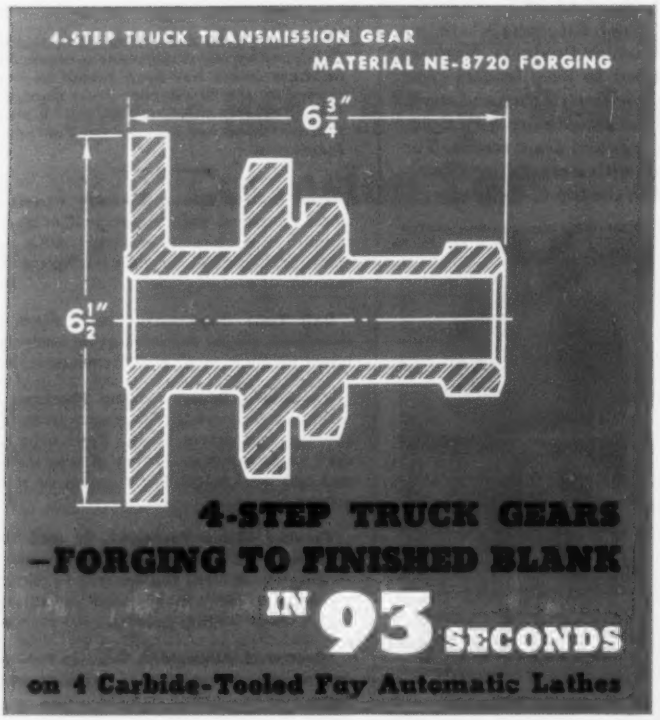
BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865

Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal

Warehouse Service with Slitting Facilities in Principal Cities

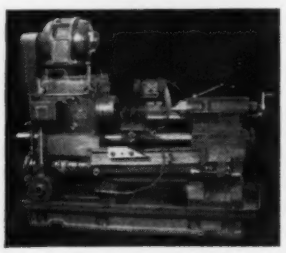
Advertisement

DO YOU COMPETE AGAINST PRODUCTION LIKE THIS ?



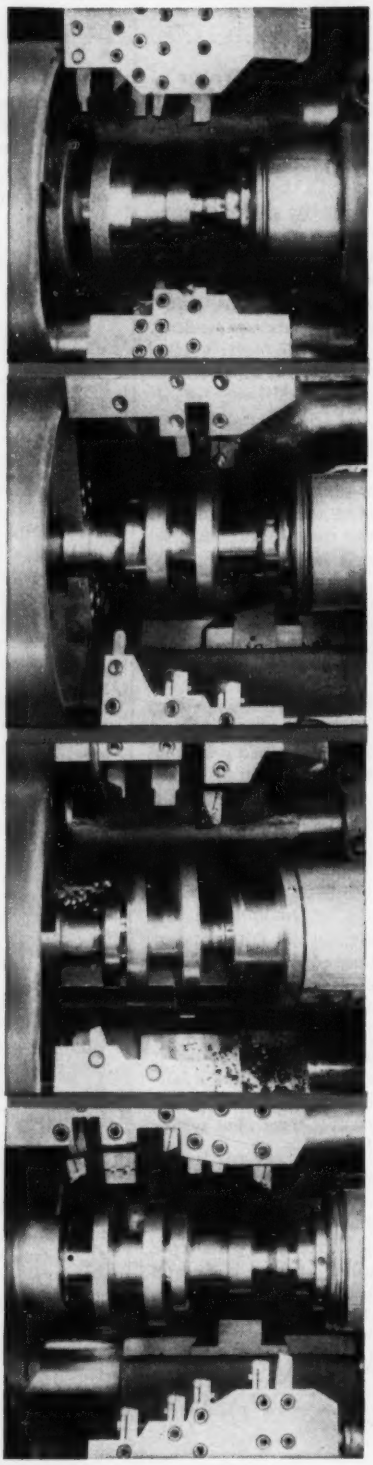
This 4-operation gear job is a striking example of production turning on the Fay Automatic Lathe. Every tool has either a brazed or an insert-type carbide tip. Approximately 68 HP is transmitted during the first operation! Surface speeds range from 450 to 660 FPM. The blanks are completely turned, faced, formed and grooved, with every important surface held true and concentric . . . Moreover, these 4 machines are doing the work formerly done by 17!

Why not write us for more details? Let us show you why it's cheaper to own a Fay than to compete against one!



Our new 16" Fay Catalog contains many other examples of high production turning. Write to Dept. 710F for your copy.

DESIGNED To lower every turning cost. ***BUILT*** For maximum production with either carbide or high speed steel tools. ***POWERED*** To produce more chips per tool, more pieces per hour, more profit per job . . . than any automatic lathe of comparable range.



24 SECONDS 1st operation

28 SECONDS 2nd operation

18 SECONDS 3rd operation

23 SECONDS 4th operation

Fay Lathe Division

J&L JONES&LAMSON MACHINE COMPANY
Springfield, Vermont, U.S.A.

MACHINE TOOL CRAFTSMEN SINCE 1835

QUALITY, TOO, IS MORE THAN SKIN-DEEP

Weirzin

ELECTROLYTIC ZINC-COATED SHEETS AND STRIP

Conspicuous in its flawless surface is Weirzin's electrolytically deposited coating of malleable zinc. And that's all you're likely to see of Weirzin, for—even after deep drawing—the zinc remains intact, forming an impervious protective coating, safe from underfilm corrosion.

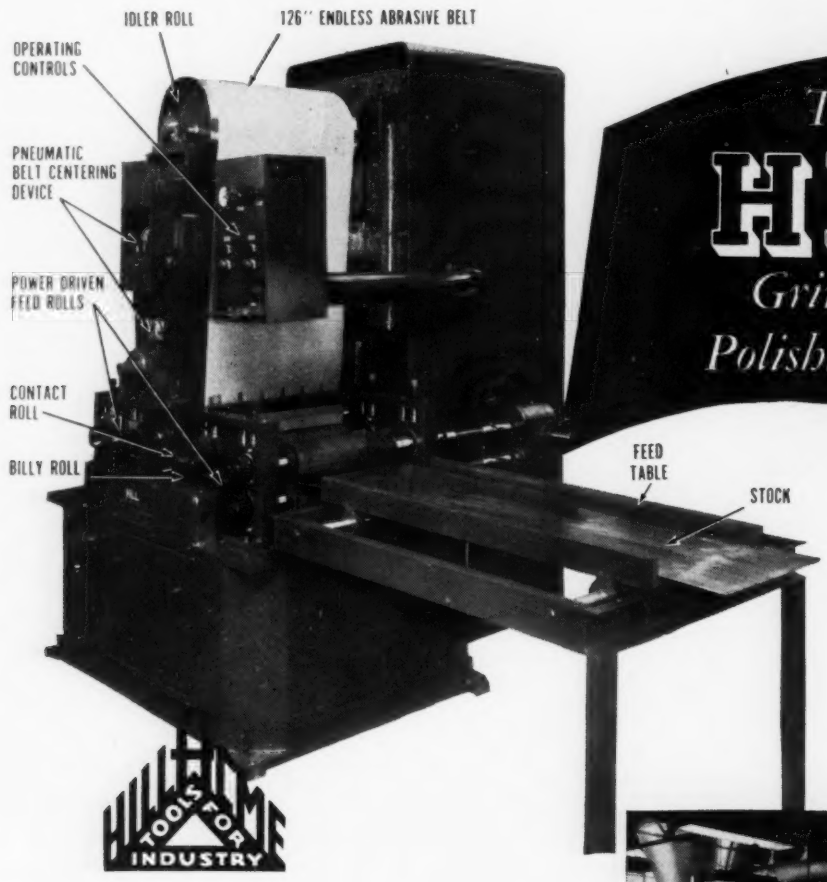
But the quality of Weirzin is more than skin-deep. Beneath its zinc coating is Weirton's own cold-rolled steel, noted for its ductility, uniformity of gauge, and adaptability to drawing and forming operations.

Weirzin, in short, enables you to make better products—and with appreciable manufacturing economies.

WEIRTON STEEL CO.

WEIRTON, W. VA., *Sales Offices in Principal Cities*

Division of **NATIONAL STEEL CORPORATION,** *Executive Offices, Pittsburgh, Pa.*



The new HILL *Grinding and Polishing Machine*

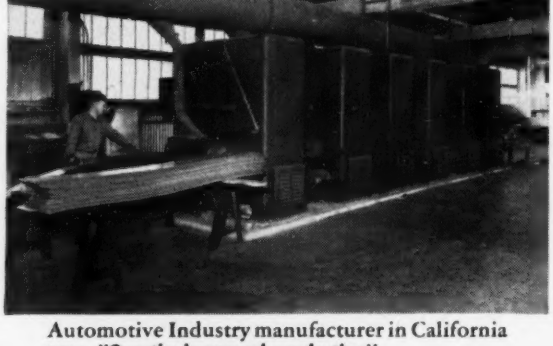
Illustrating salient features of "Hill" 2-Roll Vertical Abrasive Belt Pinch Roll Type Grinding and Polishing Machine (with cover removed).

• A large number of these new "Hill" Grinding and Polishing Machines with power driven feed rolls are in use today for pre-finishing, conditioning and salvaging operations of ***flat*** sheets, plates and blanked shapes. These machines may be used as individual units or in synchronized multiple stage assemblies for continuous line finishing prior to forming. They are manufactured in various widths up to 72".

"Hill" Abrasive Belt Grinding and Polishing Machines are also furnished in two other types, i.e., Hydraulic Reciprocating Table Type for individually processing sheets and plates of ferrous or non-ferrous metal, and the Strip Type for conditioning strip material in coil form.

Our Engineering Staff will cheerfully aid you in selecting suitable equipment for your requirements. Send for illustrated bulletin.

Southern Ohio Automotive Industry manufacturer says, ***"Vastly improved quality".***

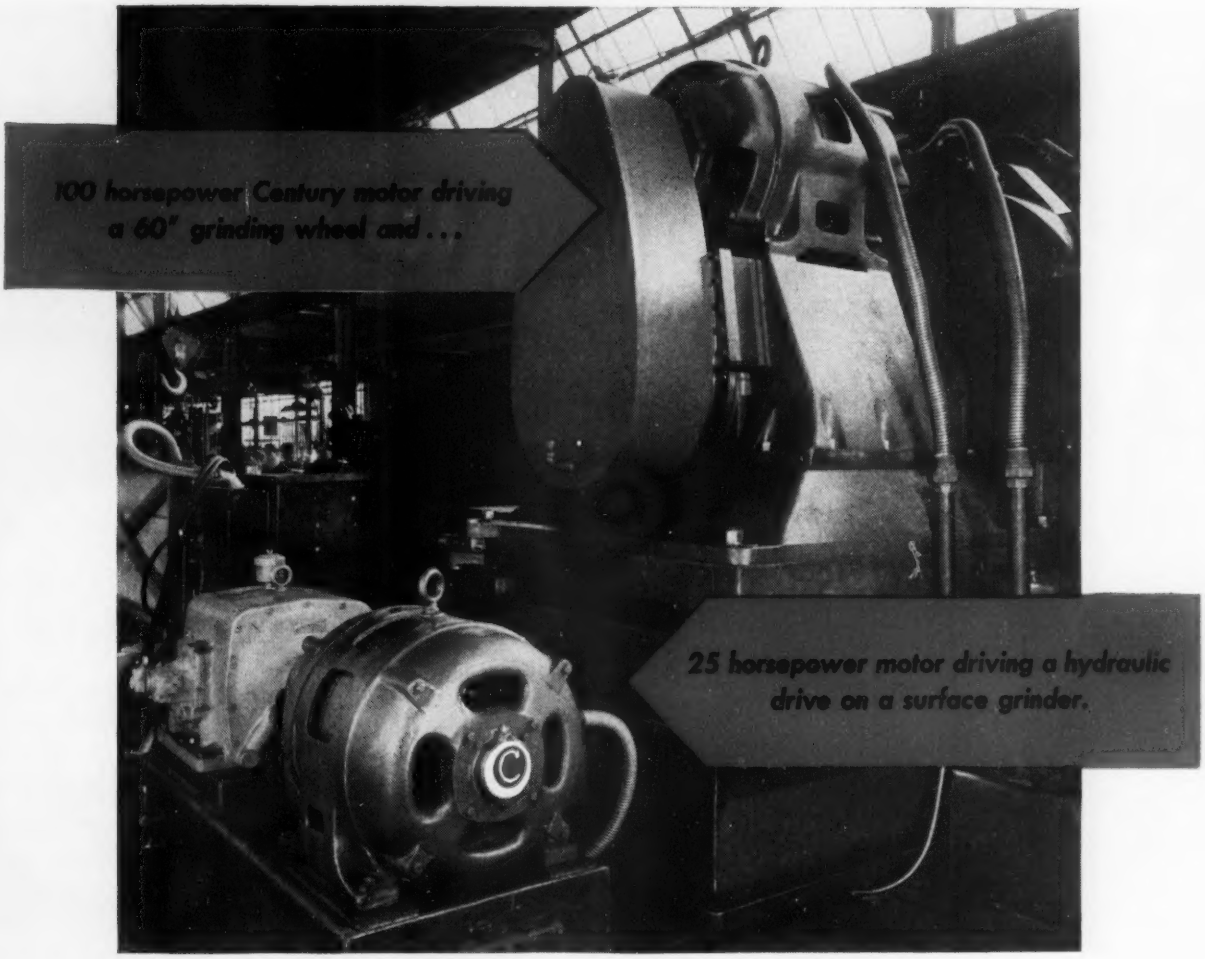


Automotive Industry manufacturer in California says, ***"Greatly increased production".***

THE HILL ACME COMPANY

6400 BREAKWATER AVENUE • CLEVELAND 2, OHIO

"HILL" GRINDING AND POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • ALSO MANUFACTURERS OF "ACME" FORGING THREADING • TAPPING MACHINES • "CANTON" ALLIGATOR SHEARS • PORTABLE FLOOR CRANES • "CLEVELAND" KNIVES • SHEAR BLADES


100 horsepower Century motor driving a 60" grinding wheel and . . .
25 horsepower motor driving a hydraulic drive on a surface grinder.

100 H. P. Century MOTOR—Driving a 60" Grinding Wheel Provides a Smooth Production Combination

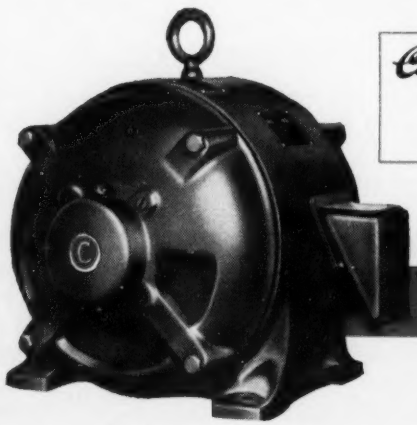
This 100 H.P. Century Motor operating a huge 60" surface grinder and the 25 H.P. Century motor operating the feeder mechanism, is one of the hundreds of thousands of Century drives used in the precision production industries.

The unusual freedom from vibration designed and built into Century motors, contributes to the precision grinding at the business end of the grinder that was intended by the manufacturer of this fine tool.

The rugged mechanical design of Century motors are suitable not only to precision applications like this but also for the heavy shock loads required in some industrial operations.

From Century's wide range of types and kinds of motors, in sizes from 1/6 to 400 horsepower, you can select the correct motor to meet the exact requirements of your machines. The properly selected Century motor on your machine tools, conveyors, processing machinery, etc., helps to increase productivity, keep maintenance costs low and reduce plant shutdowns caused by improperly applied motors.

Specify Century motors for all of your electric power requirements.



Century C MOTORS

Popular types and ratings are generally available from factory and branch office stocks

CENTURY ELECTRIC COMPANY

1806 Pine St., Saint Louis 3, Missouri

Offices and Stock Points in Principal Cities

-608

Snap that toggle switch. On go the lights. And several Central binder head screws are always there, protecting your lighting circuit. Pick up your phone and Central stainless fillister screws are on duty in the switchboard that routes your messages the Central way—efficiently. Yes, Central fasteners are specified for better and faster assembly of these and all other types of electrical products.

Fast DELIVERIES...

FROM CENTRAL'S **2** BIG PLANTS

STANDARDS FROM STOCK

SPECIALS TO ORDER

A TWO-PLANT ORGANIZATION FOR QUICK NATION-WIDE SERVICE

"You Can Depend on Central"

CENTRAL SCREW COMPANY

3501 SHIELDS AVE., CHICAGO 9, ILL. • 149 EMERALD STREET, KEENE, N. H.

Can you take advantage of this REAL ECONOMY?

THIS 2" TURRET LATHE

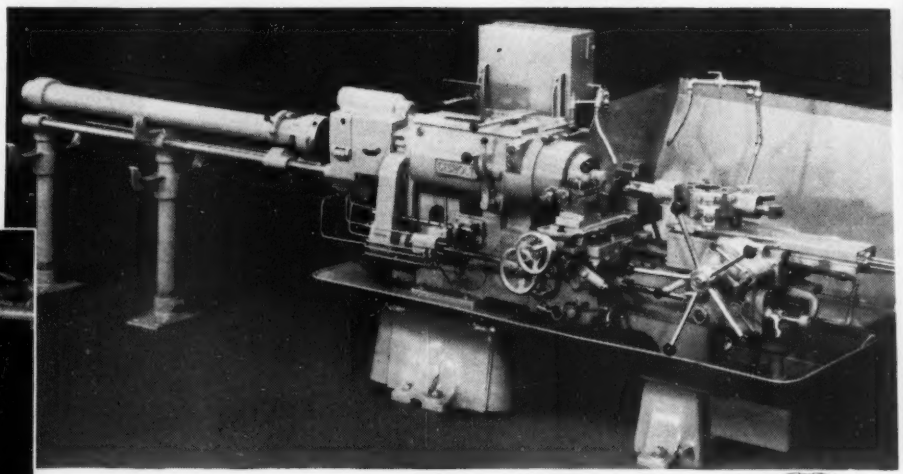
HAS 4½" COLLET CAPACITY for tubing, plastics and lightweight bar stock

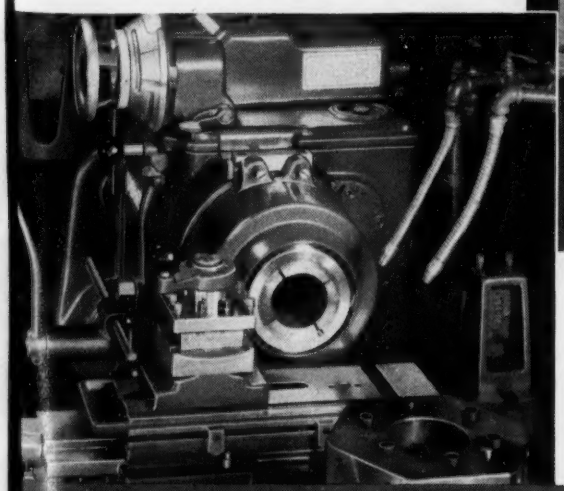
GISHOLT No. 4 UNIVERSAL RAM TYPE TURRET LATHE

You don't have to invest in expensive heavy-duty lathes to handle large diameter work of this nature. Here is the ideal lathe to machine tubing, plastics, or lightweight bar stock such as aluminum. You can use it for softer metals like brass, too.

The Gisholt No. 4 Ram-Type Turret Lathe (normally 2" bar capacity) can be furnished with a larger spindle bore providing 4½" round collet capacity. This machine gives you all the modern operating advantages which mean high speed production and low costs. It may be the economical solution to your problem. Ask your nearest Gisholt representative about it. Or write us for complete information.

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

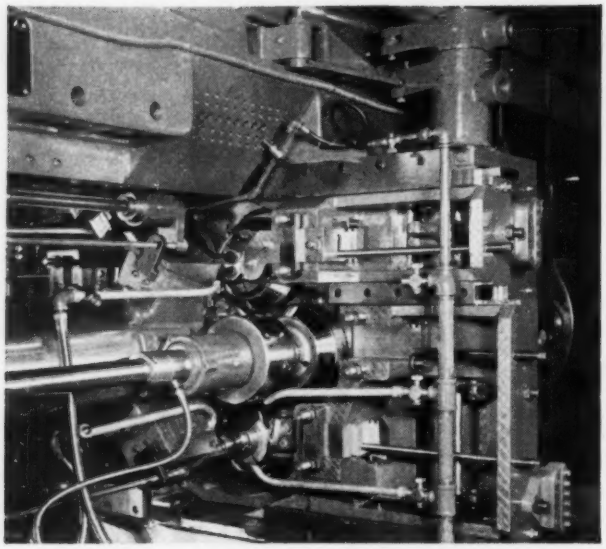




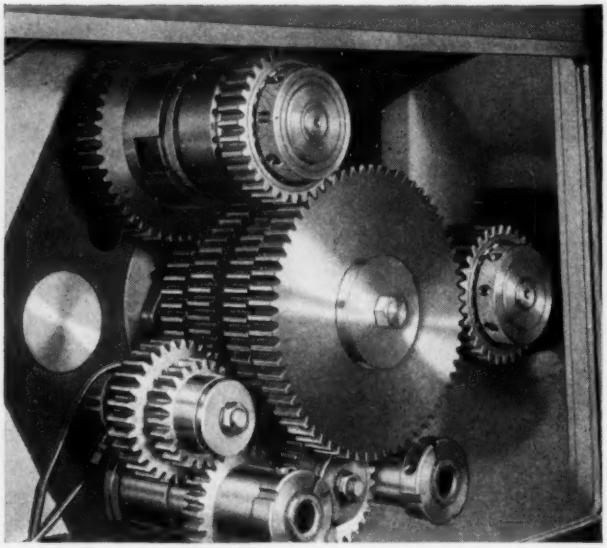
The Gisholt No. 4 Ram-Type Turret Lathe with 4½" round collet capacity and equipped with 4½" bar feed. (At left) Close-up view of 4½" capacity collet chuck. This machine is ideal for large diameter tubing.

THE GISHOLT ROUND TABLE represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

TURRET LATHES · AUTOMATIC LATHES · SUPERFINISHERS · BALANCERS · SPECIAL MACHINES



Full Swing for Main and Auxiliary End Slide Standard and Special Tool Mountings



Cone "Full-Choice" Open End Attachment Drive

IS HALF A LOAF BETTER THAN ONE?

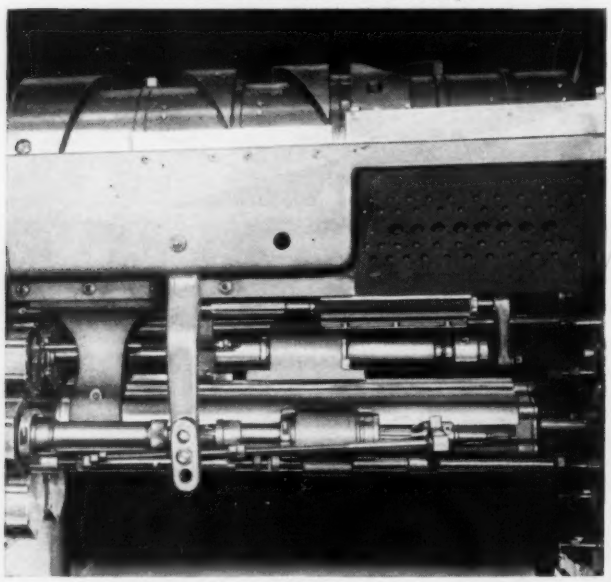
Machine capacity can usually be measured by tooling accommodation. The facility available to handle the job will determine a machine's dollar value.

Lack of a "full choice" accommodation of tooling positions for endworking tools and attachments can be a costly handicap to a multiple spindle automatic. The inability to swing to full collet capacity die heads, hollow mills, trepans, and internal necking tools, can limit a machine's usefulness on many jobs from zero up. Like half a loaf — better than none, but much less than one.

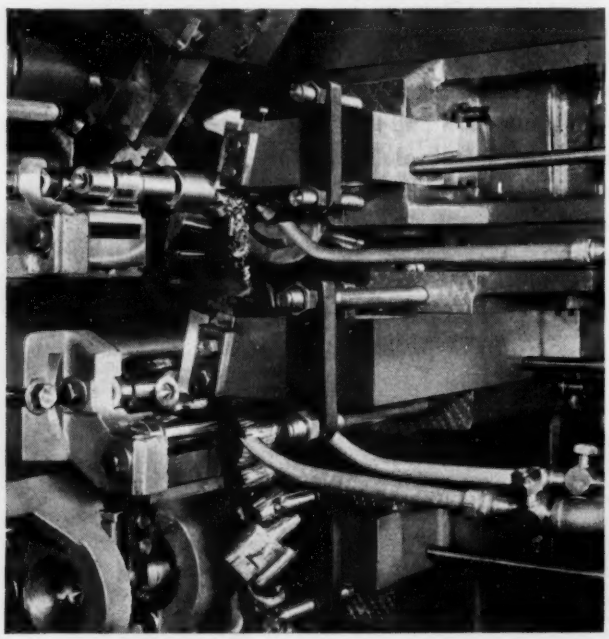
The "full choice" tooling accommodation of Conomatic cross slides, main end slides, auxiliary end slides and endworking attachment drive positions, are worth checking.

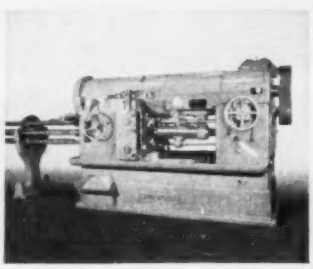
Write to Cone for Buyer's Chart which lists overall requirements of Multiple Spindle Automatics.

"All-Position" End Attachment Mounting



Standard Forming Slide and Auxiliary Cross Slide Facility





A comparison with ALL Automatics will lead you to

#6

Conomatic}

CONE AUTOMATIC MACHINE COMPANY, INC.
WINDSOR, VT., U.S.A.

Answer

...to all your Fastening Questions

REPUBLIC

UPSON

BOLTS AND NUTS

Whatever the question, you'll find the *right* answer in the REPUBLIC Upson *full line* of headed and threaded products. Throughout 20,000 different sizes and shapes, they are made to fit right and hold tight. Republic Steel Corporation...Bolt and Nut Division, Cleveland, Ohio, and Gadsden, Ala. Export Department: Chrysler Bldg., New York 17, N. Y.

REPUBLIC STEEL
REG. U.S. PAT. OFF.

IMPORTANT!

Save the Cost of Removing "DECARB"

. . . USE REPUBLIC UNION COLD DRAWN "CARBON CORRECTED" BARS

If you make steel parts which are heat treated to produce high surface hardness around a tough core—particularly those parts hardened by high frequency induction heating—here's an easy way to cut unit production costs: Use Republic Union Cold Drawn "Carbon Corrected" Bars.

Through carbon correction annealing in prepared atmosphere, the carbon lost by decarburization during hot rolling is restored to the surface of the bars, permitting them to be used in the original cold drawn condition. Thus, the cost of removing "decarb"—which in a steel like C-1050 frequently means the removal of 20 thousandths of an inch or more—is saved.

Because the treatment includes annealing as well as carbon correction, steels such as C-1050 and C-1151, frequently used for parts requiring high surface hardness, also are substantially improved in

MACHINABILITY.

That's a quality which you will *ALWAYS* find in every Republic Union Cold Drawn Steel —whether it's Bessemer screw stock, a carburizing grade or a stainless steel. MACHINABILITY comes first at Union Drawn—has taken precedence over everything else in laboratory and mill for some 58 years.

Union Drawn metallurgists and engineers are ready to help YOU in using "Carbon Corrected" or any other Republic Union Cold Drawn Steel Bars to best advantage—to improve your product, to increase production efficiency, to cut costs. Write us.

REPUBLIC STEEL CORPORATION
Union Drawn Steel Division • *Massillon, Ohio*
GENERAL OFFICES . . . . . CLEVELAND 1, OHIO
Export Department: Carnegie Building, New York 17, New York

Above Left: Photomicrograph showing "decarb" to a depth of .020" in the surface of a hot rolled bar of C-1050 steel—magnified 100 times.

Above Right: Photomicrograph showing the same bar after carbon correction annealing. Note the restoration of carbon on the surface and also the refinement of grain structure.

Below Right: One of the radiant tube, prepared-atmosphere furnaces in which bars are carbon correction annealed.

HOW CARBON CONCENTRATION CONTROL BENEFITS THE ENTIRE METAL INDUSTRY

All industry benefits from the use of cold drawn bar stock that features cost-saving qualities and processing advantages such as—

- Uniform carbon content from center to surface.
- Improved machinability.
- No "decarb." Eliminates surface grinding and machining.
- Eliminates necessity of buying oversize stock.
- Costs so little more.

These advantages are possible as a result of the application of Gas Chemistry to heat treatment. The process is known as *"Carbon Concentration Control", introduced to the metal industry by 'Surface' researchers and engineers. Since then the practical application of this process of heat treatment has indicated outstanding advantages affecting metallurgical qualities, workability, and savings.

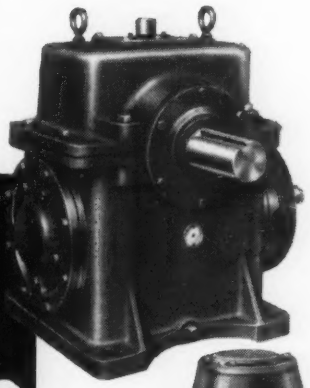
Write for bulletins on 'Surface' applications of Gas Chemistry to the heat treatment of metals.

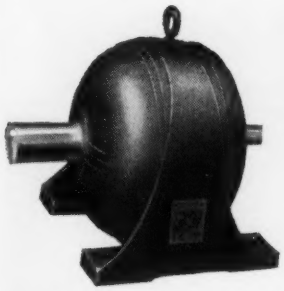
SURFACE COMBUSTION CORPORATION
TOLEDO 1, OHIO

*"Carbon Concentration Control" reprinted in A. S. M. Transactions, Volume 38, 1947. PP 639—681.

'Surface' INDUSTRIAL FURNACES •

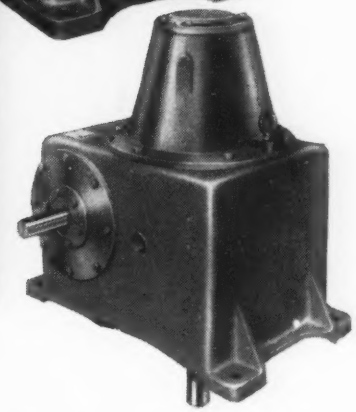
Foote Bros. Hypower Enclosed Worm Gear Drives assure economy in original cost and economy in operation. They bring a new compactness in design plus greatly increased thermal capacity. Available in vertical and horizontal types.





Foote Bros. Straight Line Enclosed Gear Drives will shortly be introduced. These compact units may be used with any standard motor. Ratios range from 5 to 240 to 1.

looking for drives?



THEN LOOK TO FOOTE BROS.

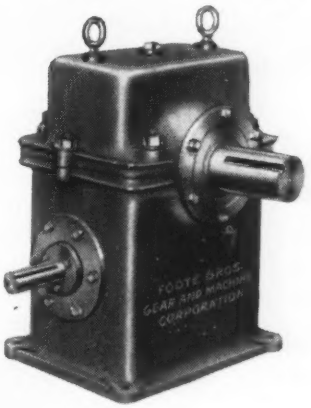
Foote Bros. Hytop Enclosed Worm Gear Drives provide wider low-speed bearing span. Ideal for installation where low-speed shaft extensions cannot be supported by pilot or guide bearings at the end of shaft. Available in both Hygrade and Hypower types.

If you require enclosed gear drives, the Foote Bros. line offers a wide variety of types, sizes and ratios to meet any need.

Nearly a century of engineering and manufacturing experience is back of Foote Bros. Drives. Two large plants contain the newest in gear generating equipment—new techniques in manufacture—better metallurgical control of materials—improved manufacturing methods—all assure you superior enclosed gear drives.

Mail the coupon for information.

Foote Bros. Hygrade Enclosed Worm Gear Drives have been newly engineered and now offer the maximum in rugged dependability. Specially designed for heavy-duty applications. Available in both horizontal and vertical types.



AVAILABLE FROM STOCK

A new policy of distribution now makes Foote Bros. Enclosed Worm Gear Drives available from stock. A range of sizes and ratios is offered to meet many industrial applications.

Foote Bros. Maxi-Power Helical Gear Drives are available in single, double and triple reductions. A newly engineered line that represents the last word in modern power transmission equipment.

FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION
Dept. X, 4545 S. Western Blvd., Chicago 9, Illinois

Foote Bros. Gear and Machine Corporation
Dept. X, 4545 S. Western Blvd., Chicago 9, Ill.

Gentlemen: Please send me information on drives checked below:

- ☐ Hypower Enclosed Worm Gear Drives
- ☐ Hygrade Enclosed Worm Gear Drives
- ☐ Maxi-Power Enclosed Helical Gear Drives
- ☐ Straight Line Enclosed Gear Drives

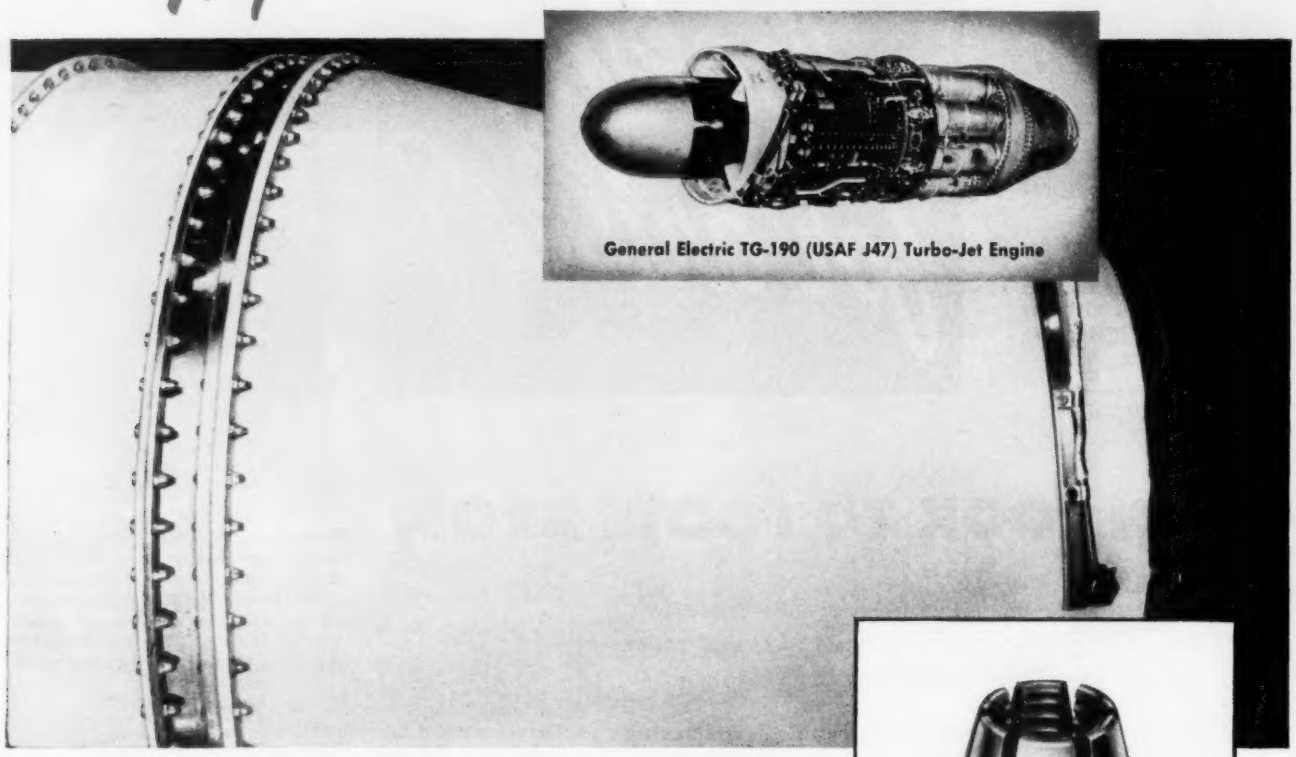
Name .....

Company .....

Address .....

City ..... *State* .....

NEW! *High-Temp Nut* HOLDS WITHOUT SEIZURE AT 1200°F.



General Electric TG-190 (USAF J47) Turbo-Jet Engine

Self-locking Elastic Deflection protects against VIBRATION! *permits* INTERCHANGEABILITY!

The extreme heat generated in exhaust manifold systems, turbo-jet tail cones and similar installations create strength and seizure problems in ordinary fasteners—problems that are solved by ESNA's NEW Z-1200 Hex and Anchor Nuts.

These new nuts shown above on the tail cone flanges of the General Electric TG-190 retain their strength and locking torque characteristics even after repeated use at 1200°F. They are readily removed . . . do not seize the bolt or damage the threads.

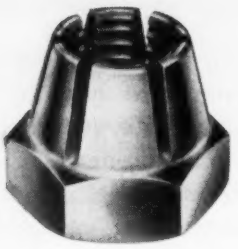
Further, the elastic deflection built into the Z-1200's locking-beams makes them re-usable—interchangeably . . . because exact design assures locking torque within the tolerance range of Class 3 bolts.

ESNA Z-1200 Nuts—like all Elastic Stop Nuts—are designed for rapid field service replacements to simplify maintenance. They are self-locking anywhere on a bolt or stud without frictional aid from bolt tension or seat pressure.

HERE'S A CHALLENGE. Send us complete details of your toughest bolted trouble spot. We'll supply test nuts—FREE, in experimental quantities. Or, if you want further information, write for literature.

ESNA TRADE MARK

Elastic Stop Nut Corporation of America, Union, New Jersey. Representatives and Agents are located in many principal cities.



HIGH TEMPERATURE NUTS
HEX AND ANCHOR—FOR 1200°F
(Esna Type Z-1200)

Stainless Steel type 18-8 Columbium stabilized, silver plated, the new ESNA Z-1200 nuts will NOT seize the bolt or gall the finish. Vibration, impact or stress reversal will not disturb their pre-stressed or positioned settings.

THEY ARE RE-USABLE

ELASTIC STOP NUTS

HIGH TENSILE · ANCHOR · WING · SPLINE · CLINCH · GANG CHANNEL · NYLON CAP

OVER 450 TYPES AND SIZES IMMEDIATELY AVAILABLE FROM STOCK

2 STAND, 4 HIGH TANDEM BRASS MILL

. . . for rolling brass sheet and plate for watch parts, door hardware, housewares, lamps, novelties, etc.

Designed and built by

UNITED

ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

PLANTS AT: PITTSBURGH · VANDERGRIFT · NEW CASTLE · YOUNGSTOWN CANTON

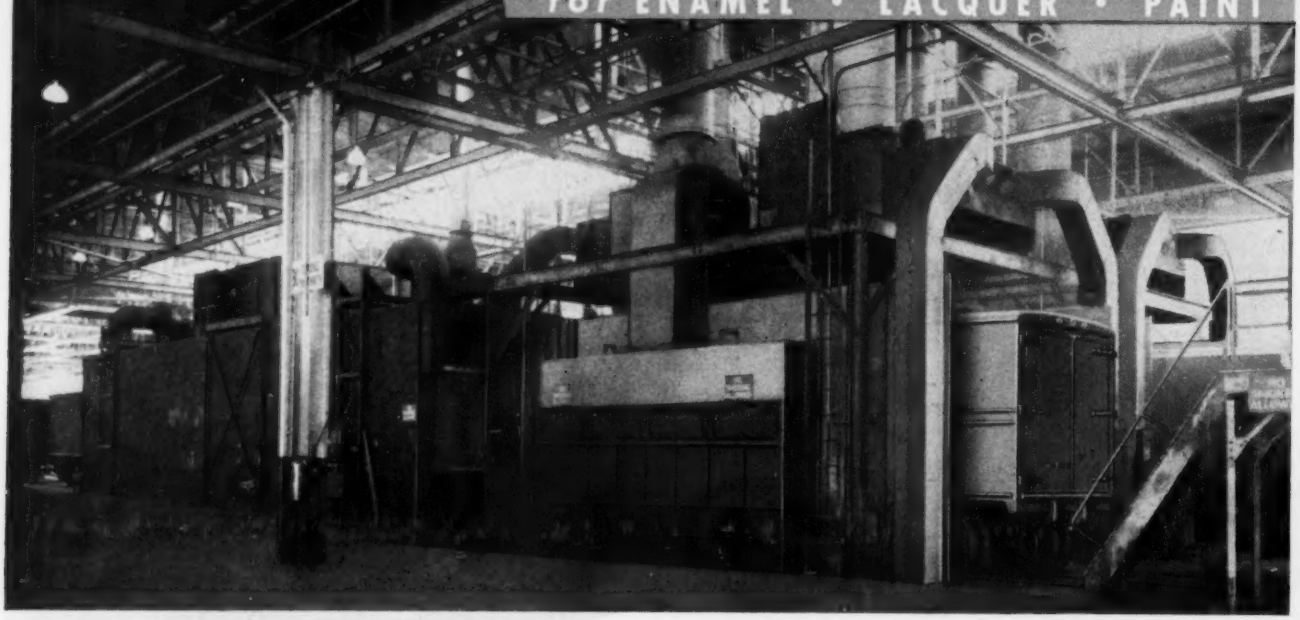
Subsidiary
Adamson United Company, Akron, Ohio

Affiliates:
Davy and United Engineering Company, Ltd., Montreal, Sheffield, England
Dominion Engineering Works, Ltd., P. Q. Canada
S. E. C. I. M., Paris, France

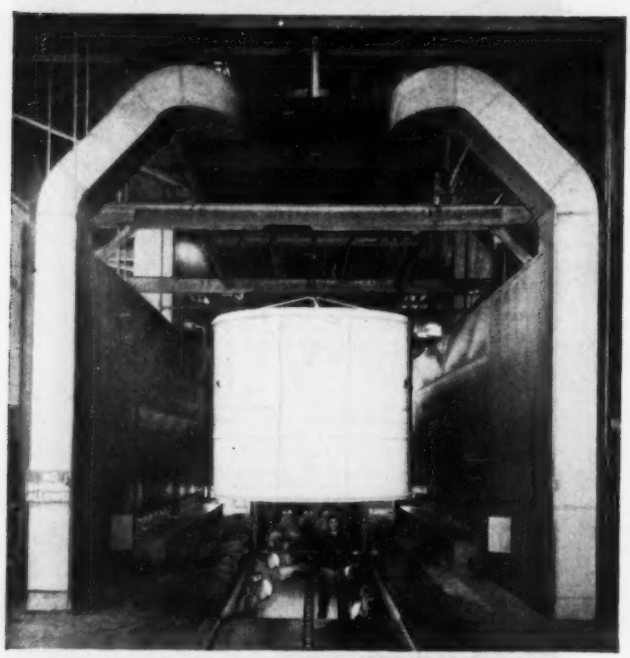
Designers and Makers of Rolls and Rolling Mill Equipment

COMPLETE *Finishing* SYSTEMS

for ENAMEL • LACQUER • PAINT



Finish Coat Hydro-Filter Spray Booths and Baking Ovens on Two Finishing Production Lines 1750 Ft. Long—Part of a Complete Mahon Finishing System in Fruehauf's New Plant, Avon Lake, Ohio.



Fruehauf Truck Trailers Passing Through Mahon Hydro-Filter Chassis Spray Booth on One of the Production Lines at the Avon Lake Plant

. . . Better Finish at LOWER COST with Modern Finishing Equipment!

In any industrial plant where finishing constitutes a major operation, a modern, well planned Finishing System is essential to low-cost production . . . the equipment must be properly planned, and properly engineered and co-ordinated with the general production scheme, in order to achieve minimum finishing cost per unit processed in every day operation. That is why initial capital outlay for equipment of this type is a secondary consideration . . . that is why you should take advantage of the broadest experience available when contemplating new Finishing Equipment for your plant. The Mahon organization offers you the benefit of their experience in pioneering development in this highly specialized field through the past twenty-eight years . . . an accumulated wealth of technical knowledge and practical know-how not available to you elsewhere. See Mahon's Insert in Sweet's Mechanical Industries File for complete information, or arrange consultation.

THE R. C. MAHON COMPANY

Home Office and Plant, Detroit 11, Mich. • Western Sales Div., Chicago 4, Ill.

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning and Chemical Preparation Equipment, Dry-off Ovens, Hydro-Filter Spray Booths, Filtered Air Supply System, Drying and Baking Ovens, and Paint Reclamation System. Also, Core Ovens, Hydro-Foam Dust Collectors, and many other Units of Special Production Equipment.

MAHON

Using

BARBER-COLMAN

TANTUNG-TIPPED

SLAB MILLING CUTTERS

Husky cuts in tough steel call for extra stamina in cutting tools — ability to do the job at a good rate of production, without sacrificing tool life.

For example, in this brake band milling operation, Barber-Colman Tantung-Tipped Cutters remove 23 cubic inches of SAE 5140 steel *in 58 seconds*, and do it producing 250 pieces per sharpening. This is a total of 2937 cubic inches of metal removal between sharpenings. High speed steel cutters do not stand up under this fast heavy cut.

If you have a metal removal problem, whether it's to get greater production or more economical tool life, ask your Barber-Colman representative for recommendations on *Job-Engineered Cutting Tools.*

JOB FACTS

Operation — Remove 3/8" stock, 1 3/4" wide on brake band 7" dia.

Cutters — B-C Tantung-Tipped Slab Mills, 4 1/2" x 4" x 1 1/2"

Material — SAE 5140 Steel

Cutter Speed — 175 RPM

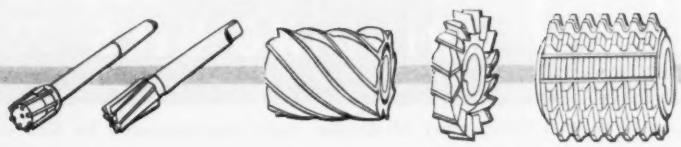
Tool Life — 250 pieces per sharp. 15-20 sharpenings

MORE DATA FREE!

Get this complete file of milling cutter performance records. Ask for File No. 4314.

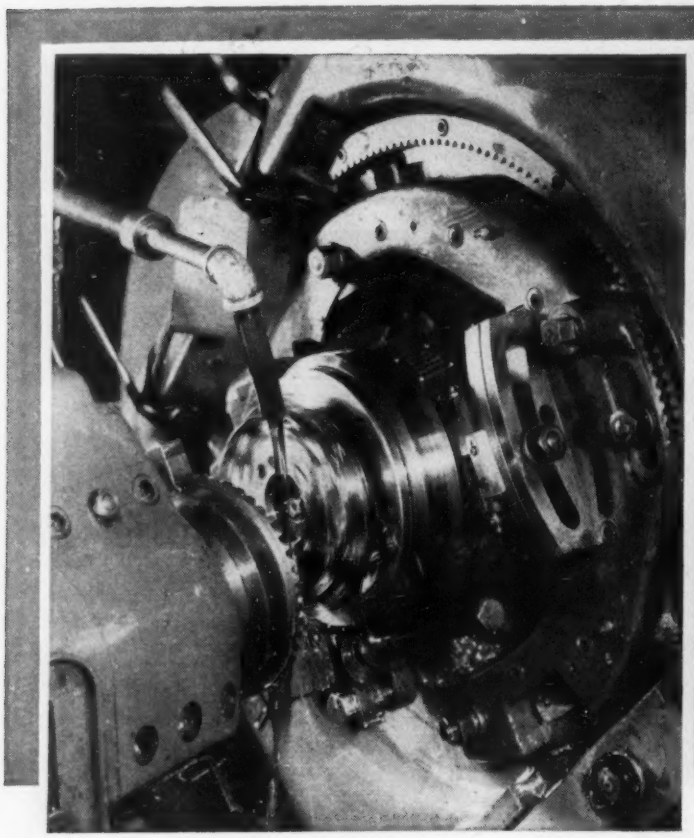
Barber-Colman Company

GENERAL OFFICES AND PLANT, 4314 LOOMIS ST., ROCKFORD, ILLINOIS, U. S. A.



BARBER COLMAN

IMPROVE YOUR MACHINING



Texaco cutting coolants help you cut faster, at lower cost, with smoother finish

IT makes no difference whether you machine steel, copper, aluminum, brass or any other metal . . . there is a *Texaco Cutting, Grinding or Soluble Oil* to help you do the job faster, cleaner and at lower cost.

Texaco Cutting, Grinding and Soluble Oils effectively lubricate work and tool — keep them cool and prevent chip welding or wheel loading. Thus, you get more cuts per tool grind, finer finish, fewer rejects — better machining whatever the metal or cutting method.

Let a Texaco Lubrication Engineer who specializes in cutting coolants advise you which Texaco oil to use for best results.

Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

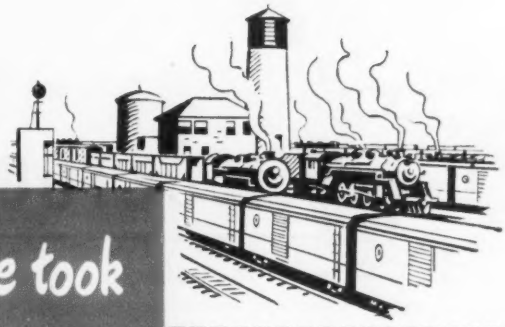
TEXACO

TEXACO CUTTING, SOLUBLE AND GRINDING OILS FOR FASTER MACHINING

Tune in . . . TEXACO STAR THEATRE presents MILTON BERLE every Wednesday night. See newspaper for time and station.

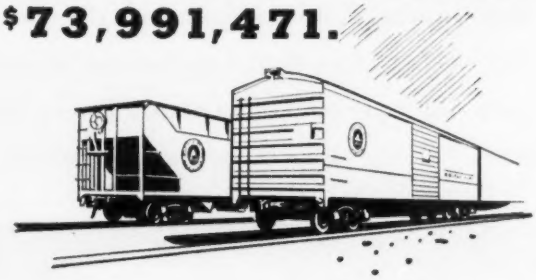
NEW COAL & ORE FACILITIES
$14,500,184.

IMPROVEMENTS THROUGHOUT LINES
$35,923,192.



Steps we took for our New Look

NEW FREIGHT CARS, ETC.
$73,991,471.



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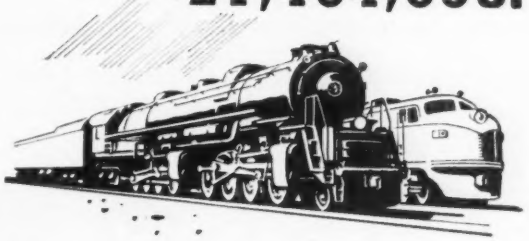

To give you finer Freight Service the Baltimore & Ohio has spent, in the last three years, $173,618,959. Constantly *doing things* better—the B & O way—means vast expenditures. All this adds up to better facilities, faster trains, and dependable service. We pay what it takes to *have* what it takes.

Those three years of "doing things better" saw 212 new locomotives on our rails, together with 19,139 new freight cars. They saw new classification yards and extensive terminals; heavier rail to carry our trains, better signals to speed them, modern communications to report their positions and furnish on-the-spot location of cars for customers; efficient, latest-type coal and ore facilities.

Never have we been better able to meet the needs of our customers. And this constant improving shall continue. As it does, you will have more and more reasons for *depending* on B & O service. *Ask our man.*

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The short cut to production savings is as simple as that—you draw up the blueprints and OSTUCO engineers and craftsmen will follow them exactly, producing a finished part or sub-assembly that will simplify your production operations, relieving production bottle-necks, increasing productive output.

OSTUCO's experienced engineers and skilled craftsmen are saving time and money for discerning manufacturers in every field of industry today. Why not check with the nearest Sales Office, to see if your product can be made better, at lower cost, with OSTUCO Tubing, fabricated to meet your most exacting specifications?

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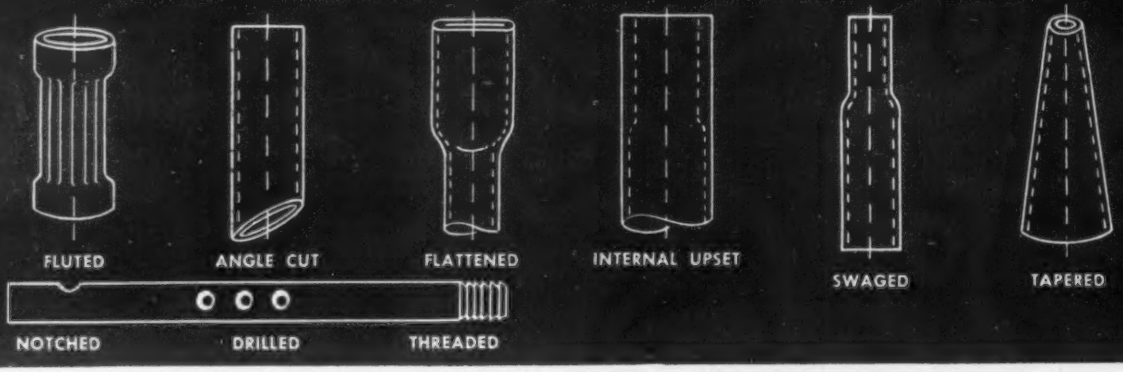

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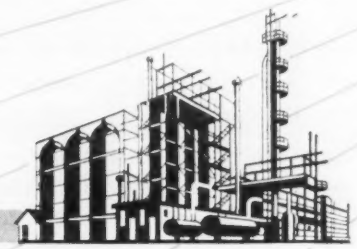
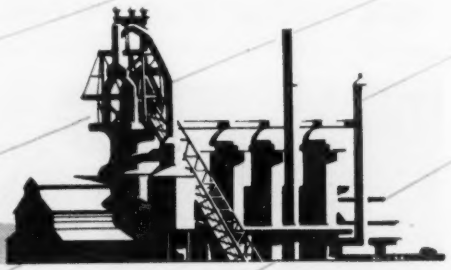
The cooperative experience and close relationship of the two divisions has proved advantageous to McKee clients in both industries.





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By DELBERT CRAVEN, Supt.
The Alliance Structural Co.
Alliance, Ohio

Delbert Craven

We fabricate many different types of cranes ranging up to 300 tons capacity. Most of these structures involve heavy, boxed-up sections on which arc blow seriously limited the amount of current and the welding speed that could be used. By installing 500-amp. AC "Fleetwelders" for this work, we have eliminated arc blow, and the operators are now able to boost their welding current from 300 to 385 amperes, resulting in 25% faster welding. Moreover, the welds are of higher quality and easier to make.

The crane girder shown in Fig. 1 is typical of the kind of weldment now being fabricated in our shop. The top and bottom plates are $\frac{7}{8}$" plate, fillet welded to $\frac{5}{16}$" side plates with large diameter $\frac{1}{4}$" "Fleetweld 7" electrodes. Many of the welds on this 85 ft. crane girder are single pass $\frac{5}{16}$" fillets requiring heavy sustained welding at high currents (Fig. 3).

Substantial savings in idle power losses are further helping to cut our costs on these jobs. Where the idle factor is high, such as leaving the welder connected to the line while fitting up parts, considerable cost savings are made since the "Fleetwelders" draw far less current from the line than the motor driven equipment formerly used.

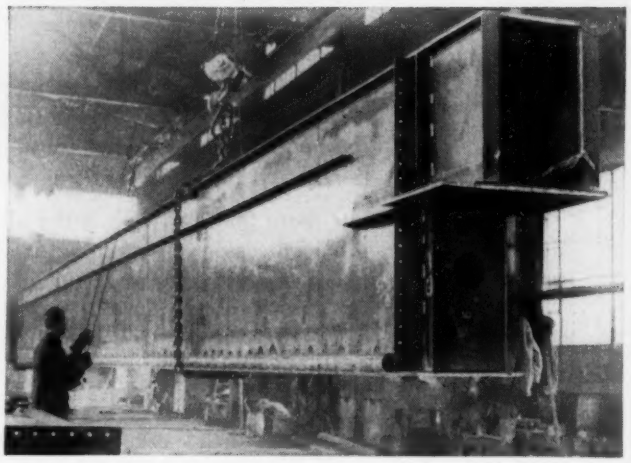

Fig. 1. Girder for 60-ton capacity crane AC weld fabricated with the new Lincoln "Fleetwelder." Top and bottom plates are $\frac{7}{8}$" steel . . . sides are $\frac{5}{16}$" plate. Girder is 85 ft. long, 76 in. high and 28 in. wide . . . weighs 20 tons.

A comparison of the all welded crane girder with similar size riveted designs shows a saving of 20% in weight. This weight saving is largely the result of eliminating connecting members and rivets by arc welding.

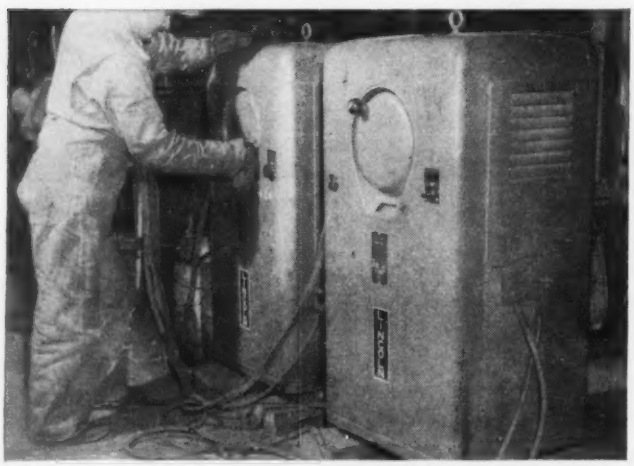

Fig. 2. Setting correct welding current with Continuous Current Control on the 500-amp. Lincoln "Fleetwelder" AC arc welder. "Fleetwelder" has exclusive "Arc Booster" that makes arc striking easy on all types of work.

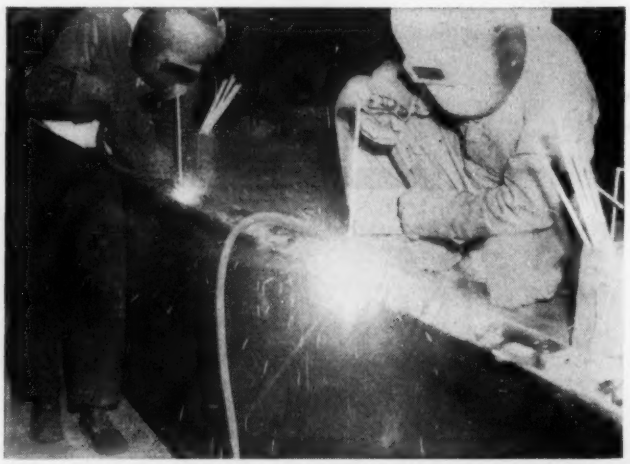

Fig. 3. Fillet welding rope guard of 5" pipe to bottom plate with $\frac{1}{4}$" "Fleetweld 7" electrode and using 385 amps. welding current. Fillet welds are single pass $\frac{5}{16}$" continuous and intermittent.

The above is published by **THE LINCOLN ELECTRIC COMPANY** *in the interests of progress.*
For further information on the "Fleetwelder," write for Bul. 366. The Lincoln Electric Company, Dept. 64, Cleveland 1, Ohio.

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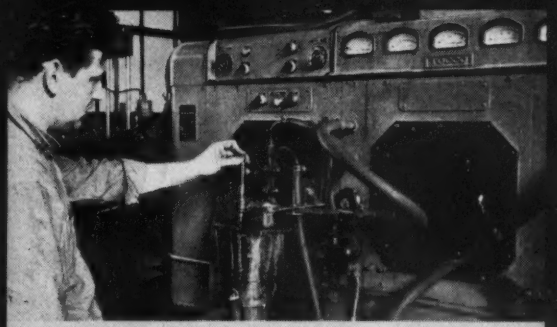

One 100 KW, 10,000 cycle TOCCO machine does 139 different production hardening jobs at Lima-Hamilton Corp., Lima, Ohio.

with TOCCO* Induction Heating

Progressive engineers at Lima-Hamilton Corporation recently adopted TOCCO Induction Heating for the hardening of bearing areas on this slide pin used in famous Lima Power Shovels. Your part may be very different but if it has to be hardened, soldered, brazed, annealed or forged TOCCO probably can cut your costs and improve your products, too.

CUTS COSTS Formerly this pin was carburized and hardened all over by conventional heating methods. Distortion was such that each part had to be straightened and then centerless ground to close limits. Rejects often ran 25% to 30%. TOCCO heats just the bearing areas that require hardening—result, no distortion, no final grinding, no rejects and 9¢ saved on each part. Production is 410 pieces per hour.

VERSATILITY, TOO In addition to the pin shown above, Lima hardens 138 other parts ranging from small screws to large gears—all on the same TOCCO machine. Between production hardening jobs, the machine is used for brazing carbide tips on cutting tools—some 10,000 during 1948. TOCCO engineers will gladly survey your plant to determine where TOCCO can cut your costs, speed-up your production, without obligation, of course.

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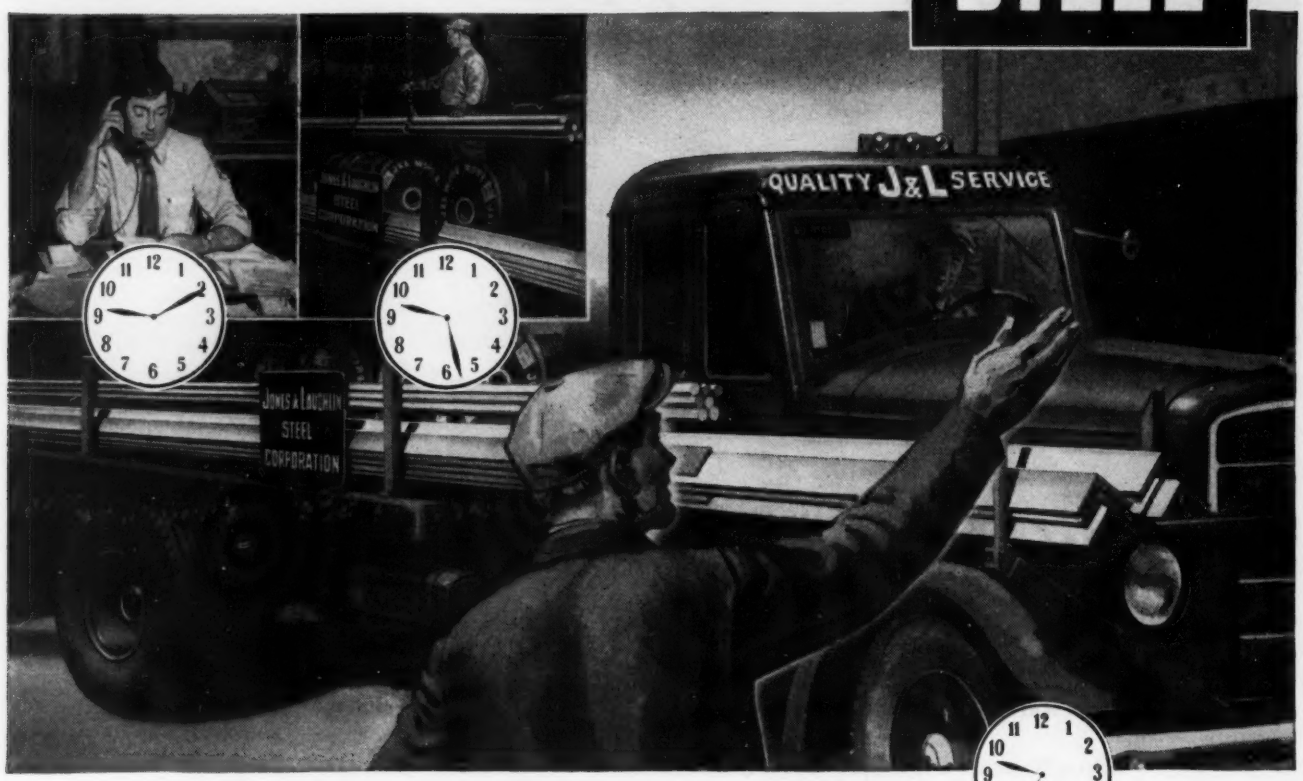
J&L STEEL



Order received 9:10 A.M.—Delivery truck on way 9:35 A.M.

At 9:10 on a Saturday morning, a telephone rang at Jim Sproat's desk in the J&L Warehouse in Chicago. At the other end of the wire, 80 miles away in Mishawaka, Indiana, C. L. Mechling, purchasing agent of the Dodge Manufacturing Corporation, said he needed some help . . . quick. He had to have seven bars of 2-7 16″ cold finished steel shafting, 16 and 20 feet long. They were needed for the power transmission system in a big industrial plant. Until they arrived, the plant could not operate. When could he have them?

There was some fast footwork. In the warehouse was a J&L truck which was going through Mishawaka. In the warehouse was steel of the proper grade and size. At 9:27, the steel was being pulled out of racks. At 9:35 the truck was on its way.

Unusual? Certainly, it was unusual. J&L Warehouses cannot get every order on its way in 25 minutes! But it happens often enough to make a lot of customers lean heavily upon them.

Quick service is a habit at J&L Warehouses—part of their stock-in-trade. Located at strategic distribution centers, they provide close-at-hand, convenient, dependable sources of supply for all who need steel in a hurry. Stocks are large and diversified, including not only the more common grades of steel, but many special grades as well—all of J&L Controlled Quality.

Listed below are the 7 Jones & Laughlin Service Warehouses and their phone numbers.

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NEW ORLEANS 6, LA......**FRanklin 1131**
PITTSBURGH 3, PA......**HEmlock 1000**
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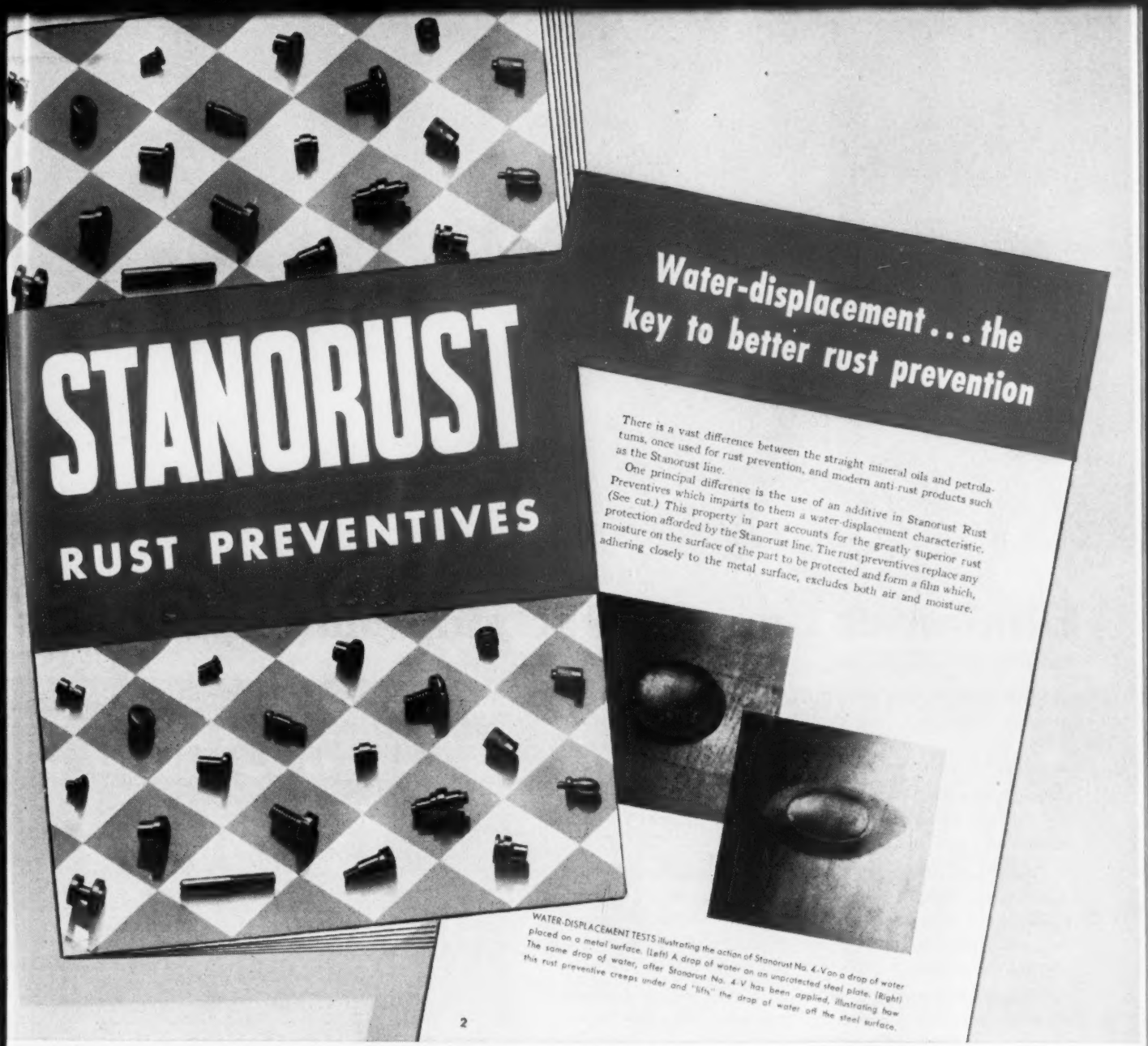
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RUST PREVENTIVES
Water-displacement . . . the key to better rust prevention
There is a vast difference between the straight mineral oils and petrolatums, once used for rust prevention, and modern anti-rust products such as the Stanorust line.
One principal difference is the use of an additive in Stanorust Rust Preventives which imparts to them a water-displacement characteristic. (See cut.) This property in part accounts for the greatly superior rust protection afforded by the Stanorust line. The rust preventives replace any moisture on the surface of the part to be protected and form a film which, adhering closely to the metal surface, excludes both air and moisture.
WATER-DISPLACEMENT TESTS illustrating the action of Stanorust No. 4-V on a drop of water placed on a metal surface. (Left) A drop of water on an unprotected steel plate. (Right) The same drop of water, after Stanorust No. 4-V has been applied, illustrating how this rust preventive creeps under and "lifts" the drop of water off the steel surface.
2

Here's the answer to your rust prevention problems

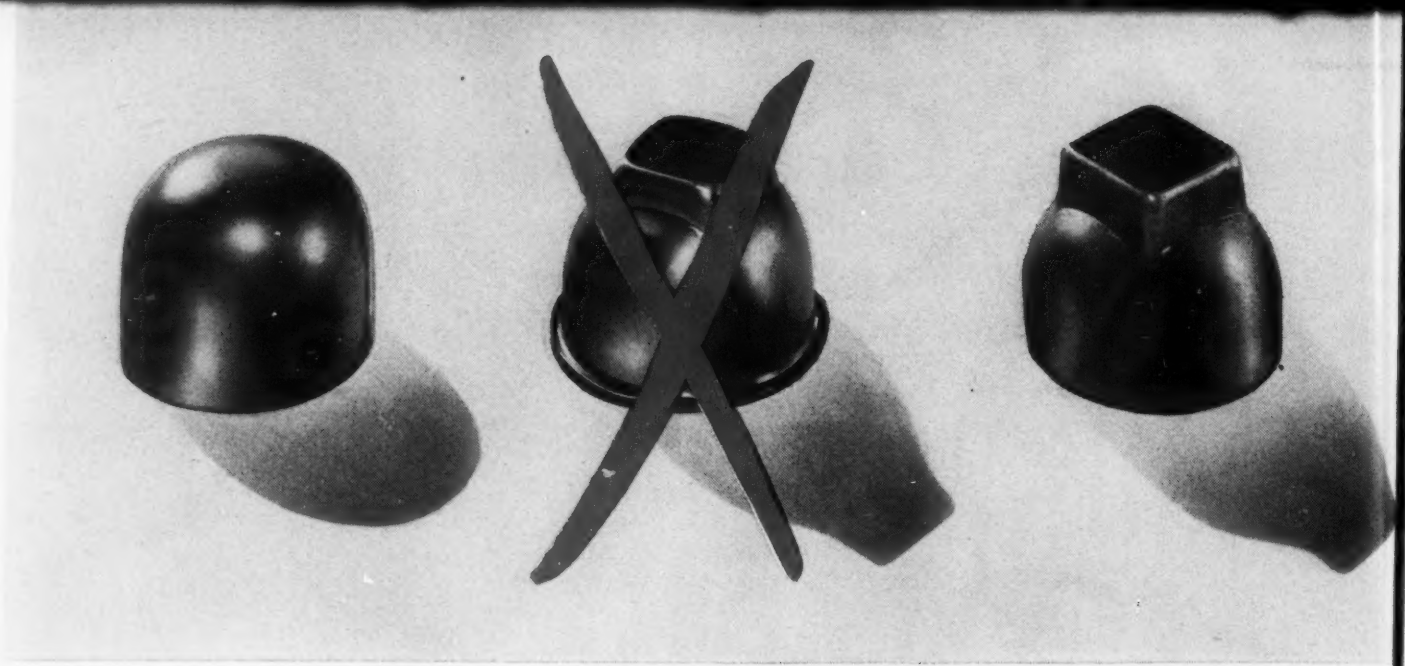
THE BOOKLET illustrated above holds the means to more complete and more economical rust control in your plant. It will help you analyze your rust prevention problems and needs. It tells how the new, improved Stanorusts now fully meet these needs.

The eight grades of Stanorust are described. They range from a fingerprint remover to a heavy, petrolatum-type product that protects against corrosion under the most severe outdoor exposure for years.

Find out why Stanorusts can mean big savings for you through better rust protection. Send for this booklet. Write for your copy today. Simply address your letter to Standard Oil Company (Ind.), 910 S. Michigan Ave., Chicago 80, Ill.

Send for a copy

STANDARD OIL COMPANY (INDIANA) STANDARD



Eliminates one of three stamping operations

A COSTLY sulfurized mineral-lard oil was used in stamping operations at the Monroe Tool & Manufacturing Co., Monroe, Michigan. Three operations (indicated above) were needed to produce hub caps from ⅛-inch stock.

After a survey of all stamping operations, a Standard Oil Cutting Oil Engineer recommended Stanostamp S Compound. The switch eliminated the second pass.

On another stamping job—producing the gear housing shown below—Stanostamp S made unnecessary a copper-plating process used to prevent breakage of sharp corners. In addition, on all stamping operations, die life was greatly increased and die polishing was cut to a minimum.

Many hours of production and tool-room time were saved through these recommendations by a Standard Oil Cutting Oil Engineer. They are typical of savings available to you through a combination

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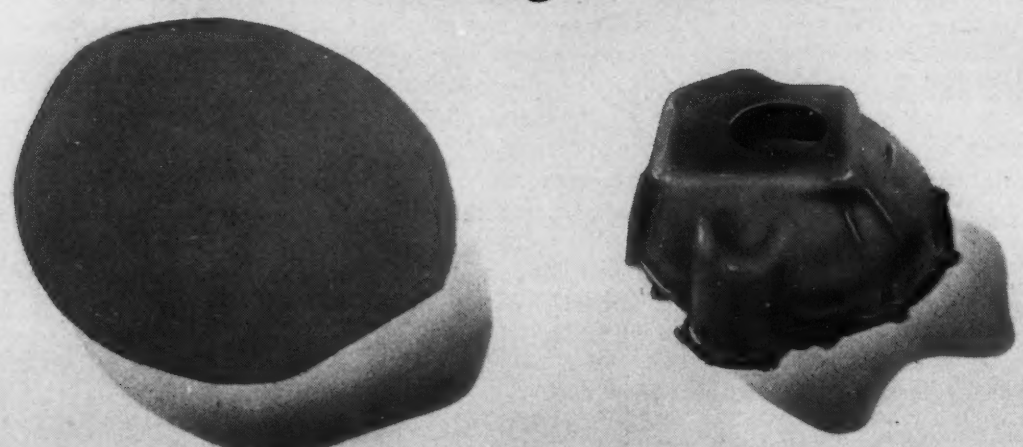
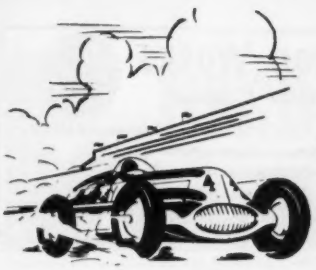
If your plant is located in the Midwest, write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois to secure the services of the Engineer nearest you.

corner-breakage eliminated



STANDARD OIL COMPANY (INDIANA)

STANDA



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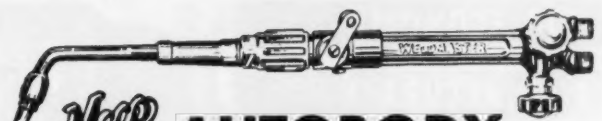

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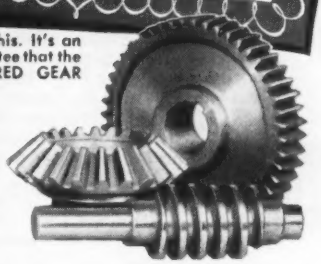

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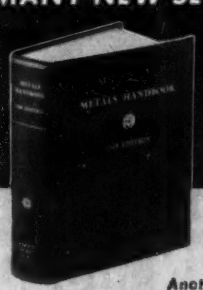

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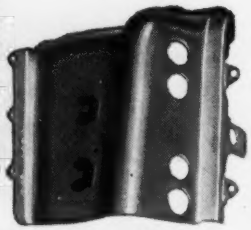

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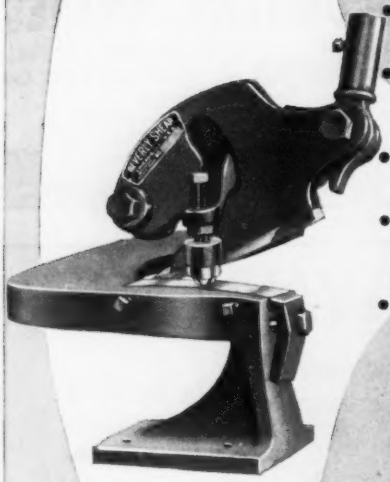

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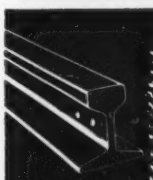

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